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HOW BOUNDARIES AFFECT PERCEIVED SAFETY:

An analysis of different types of transition between public and private spaces

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If you are more fortunate than others, build larger tables, not taller fences

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RESUMO

No âmbito dos estudos relacionados aos espaços públicos e à maneira com a qual as pessoas interagem com ele, uma linha de abordagem de grande relevância é aquela relacionada à segurança. A percepção de segurança dos usuários dos espaços públicos é fruto de uma série de fatores internos e externos, um deles sendo as barreiras entre espaços públicos e privados. Investigar a maneira em que cada um destes fatores influi na sensação de segurança do indivíduo permite uma melhor compreensão do espaço, das demandas e das formas que devemos conceber, principalmente, nossos centros urbanos. Dentro de um contexto recente em que se observa uma tendência de construir-se cada vez mais altos muros dividindo os espaços, no intuito de oferecer mais segurança e proteção áqueles que se encontram do lado de dentro destas barreiras, esta tese tem como objetivo investigar a relação entre segurança percebida e diferentes tipos de barreiras e transições entre espaços públicos e privados através de um questionário desenvolvido para tal fim, no uso de imagens reais permite os respondentes avaliarem diferentes situações hipotéticas. O resultado final mostra que, além da influência causada pelo nível de degradação dos espaços, há um impacto negativo na segurança percebida quando os respondentes se colocam em cenários onde há a presença de muros altos e "cegos", onde não há contato físico nem visual entre os dois lados da barreiras.

PALAVRAS-CHAVE: segurança percebida, espaços públicos, muros, barreiras, questionário

ABSTRACT

Within the fields of study directly related to public spaces and the way people interact with them, one relevant approach is the one associated to safety. People's perceived safety in public spaces is a result of several internal and external factors, boundaries between public and private spaces being one of them. Investigating how each of those factors impact on one's perceived safety allows a better understanding of the space, the demands, and of the way in which urban areas should be planned and conceived. In a context of recent expansion of building developments that put up higher and higher walls in order to provide safety and protection to those within those walls, this thesis aims to investigate the relationship between perceived safety and different types of transitions between public and private spaces. This is done through the elaboration of a questionnaire containing real imagery, allowing its respondents to evaluate their safety in different hypothetical situations. The results show that besides the expected influence of the general upkeep level of the space, respondents perceived a considerate decrease of safety when they were on scenarios containing the so-called "fortress walls", high and blind walls which allow no visual or physical interaction between the two sides of the boundary.

KEYWORDS: perceived safety, public spaces, walls, boundaries, questionnaire

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1

INTRODUCTION

Public spaces have suffered in the past decades, as Jane Jacobs first predicted in 1961. The lifestyle promoted by the western society in the second half of the 20th century, associated to the large waves of privatization (Allen, 2006; Barker, 2016; Bodnar, 2015), city sprawling and absurd expansion of automobile usage, have shaped our cities in a way public spaces were set aside, while traffic and roads had the spotlight on themselves. The scale in which cities were being produced was not at all human (Gehl, 2010), and this contributed to the death of the public spaces, reaching its peak around the 1990's, while at the same time showed the urge to deal with this defining aspect of our cities. Alongside with that, public safety has become a more relevant topic of discussion in urban governance, with crime, perceived safety and (anti)social behaviors playing a big role on city planning and decision making (Barker, 2016). This can be seen through the recurrent attempts to design-out crime of public spaces and the increasing demand for surveillance, which contributed to the creation of the private 'non-places' of safe "movement" and consumption (Raymen, 2015), adding up to the phenomenon of dying open public spaces on the city.

There are several consequences to this reality that can be studied and analysed in terms of urbanism, geography, economics, psychology, criminology, health and others, and it lies on our far-from-fail-proof capacity to recognize patterns in our history the role of identifying all these consequences, correlate them with what has been happening in our cities and try to act upon the problems in order to provide our species with a safe urban habitat. When we put it into perspective, considering that more than 50% of us are already living in cities, this subject presents itself as of the utmost importance.

One of the depths in which we can study the phenomena regarding the public spaces is on the matters safety and criminality. The encounters made possible by public spaces are not always pleasant or even desirable, and crimes are the simplest example of it. The existence of criminality correlates

directly with safety (both real and perceived), in a pushing dance in which each side inflicts nothing but positive feedback on the other. Understanding how this relationship works is crucial for policy making and to deal properly with nowadays cities' safety issues. The extent in which this topic has become relevant within the academic literature (Carmona, 2010)gives the message that general awareness about the quality and safety in public spaces has grown, reaching even the high political level of discussion in the developed world.

Amongst the ways in which we deal with the subject of safety is how we deal with the risk, probability or presence of crimes. Our society's development is based on private property, and our homes are, usually, the combination of it with our personal spaces, supposed to provide us with shelter, security and comfort. Crime against households destroy these pillars and that is why we as community tend to protect our homes. But this protection can cause externalities to the public realm.

These externalities can affect public safety, city design, perception of security, pleasantness of the spaces, accessibility, social interactions and even the concept of communities, so how they interact with the urban fabric is an issue of most importance for governance and policy making, influencing even the objectives and goals we might have as society, and the vision we have for our cities.

The purpose of this dissertation is to investigate one of the oldest and most common techniques of property and personal space protection: boundaries. It can be observed the rising of walls and fences around houses, buildings and other real estate developments, but what is not known it is how (and even if) different typologies of transition between the public and the private space correlate with the perceived safety of the citizens.

Set aside well-known factors that have strong influence over perceived safety, such as incivilities and previous exposure to crime, understanding how people grasp their own safety under various types of boundaries, even if they do not consider this variable directly, is a relevant matter when it comes to the overall comprehension of the space, how we should build and provide infrastructure, and practice the philosophy of putting people as the central aspect to consider when producing our cities.

Therefore -likewise most of the topics regarding the development of cities -, the way boundaries are built, under regulation or not, and their purpose will cause positive or negative impacts on the society, and is under the responsibilities of the academic community to try to comprehend these impacts as best as possible.

This study will contemplate a bibliographic review on this topic and a case study carried out through a survey, correlating the different typologies of transition between private and public spaces with the overall perception of people subjected to those structures.

2

LITERATURE REVIEW

2.1.1 THE STREET AS PUBLIC SPACE

Cities are made, mainly, of public spaces. Streets, parks, gardens and squares are fundamental components of the urban society that have been at the very centre of studies, and many different fields have been analysing how they function, how they should function, what are their roles and how they affect society per se. Gehl (2010) defines public space as a space in which encounters can take place and, therefore, it gives life and humanity to the cities. It is this mix between proximity (physical) and remoteness (relationship-wise) that creates some tension and at the same time attractiveness to humans using these spaces (Bodnar, 2015). This logic applies also to streets. This element created by man to better connect the city and to ease movements within it is also the primary space for encounters, where people meet, interact, observe life and create city life by themselves. The street is, as William H Whyte (2000) said, "the river of life of the city, the place where we come together". It is a democratic place that allows mixture of class, culture, political views, religion and lifestyle, and therefore creates heterogeneity and thrives on it (Gehl, 2011; Savitch, 2014).

On top of that, we like to be outside on public spaces because we all tend to believe that this is a good thing to do (Amin, 2006) despite all the possible risks that we are confronting by stepping outside our houses. Living in the public space leads also to the growth of the individual, once the unplanned encounters with unknown actors and scenarios might possibly take people out of their comfort zone, forcing them to test their social skills, creativity and to deal even with their own personalities through the interaction with the others (Sennett, 1991). This is not always well seen, and even though contact with strangers produce good social outcomes like empathy and solidarity (Gaffikin *et al.*, 2010; Mehta,

2013), people tend to, sometimes, have more social trust when they experience more homogeneity in their encounters (Delhey and Newton, 2003).

Therefore, is reasonable to admit that the streets (and all public spaces) have both social and political functions, and that the conflict and synergy of these two functions are the responsible for the success or failure of these spaces. What we witnessed as society was the growth and positive aspects that pleasant, highly frequented, and good streets have given us.

However, in the past decades we have witnessed the so-called death of these spaces, specially the streets. This can be confirmed by the rising number of published studies dealing with this matter (Bodnar, 2015), and by a few other factors, for instance by the fact that nowadays streets belong more to cars than to pedestrians, as we can see in the figures 1 and 2 below:

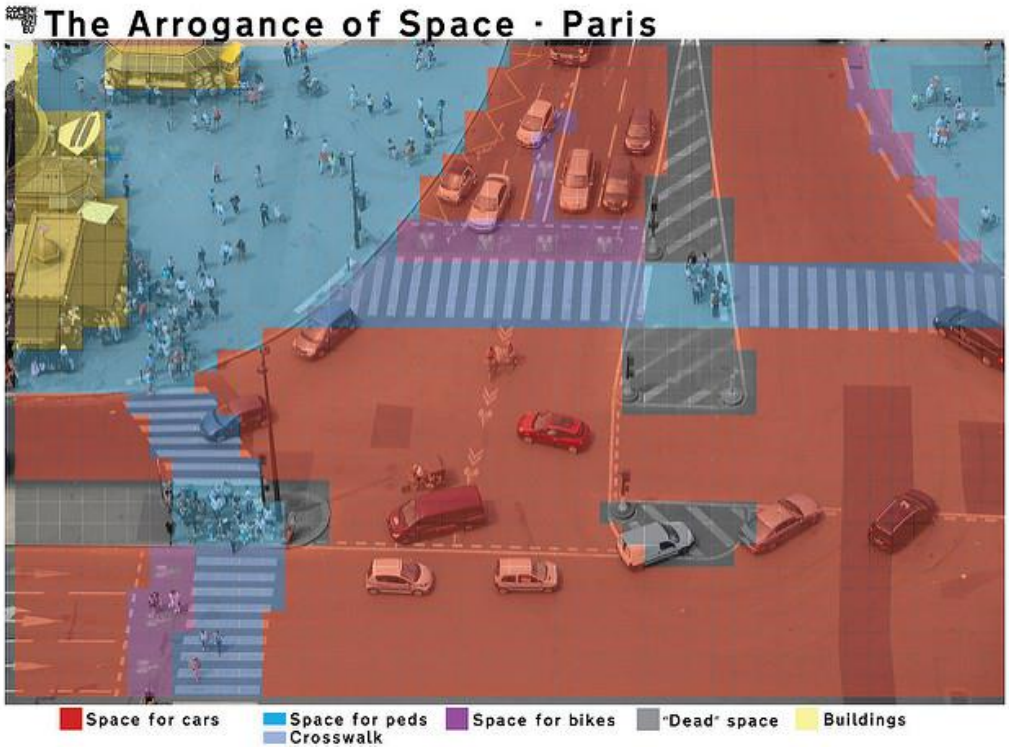

Fig. 1: Space used for people versus space used for cars. Copenhagenize Design Co. (2014)

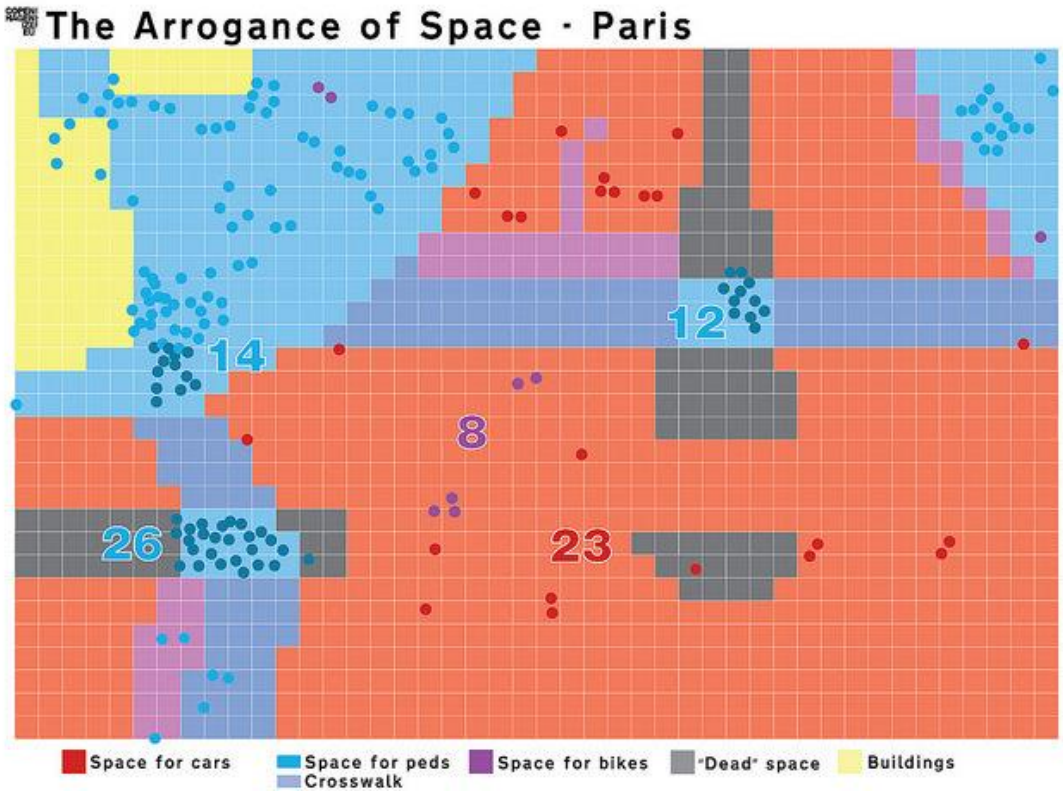

Fig. 2: Number of people, cyclists and cars on the road. Copenhagenize Design Co. (2014)

The street remains as a public space even though pedestrians are pushed aside by the design. Gehl (2010) explains it by defining what he calls "the human scale", and points outs that cities, especially the ones who had a strong influence of modernism during the second half of the past century, have been being built without taking this scale into account. Behind this situation lies the problem of reduced attractiveness of these public spaces. At a wrong scale, or in other words, not being built for people, these spaces become uninviting to the users (Gehl, 2010, 2011).

Naturally, such change in the structure and usage of the streets lead to new behaviours, perceptions and consequences of our occupation of the land. Two major change which will be discussed in this literature review are the relationship between public and private spaces, and the privatization of public spaces.

2.1.2. TRANSITION BETWEEN PUBLIC AND PRIVATE SPACES

It is common to observe the usage of "public space" as an expression that refers to a social space, rather than a public owned space: However, this is a basic misconception. The ownership (or lack of it)

of the space will rule, influence or dictate on how it will be used and experienced, and having it well defined will determine what will or can take place there (Allen, 2006; Barker, 2016; Bodnar, 2015; Lopes, 2015). That is why since the dawn of the private property we can observe the transition - sometimes smoother, sometimes harsher, but always clear – between public and private spaces. It allows the users and the owners of those spaces to perform their activities in a clearer way, and to be aware of this division and of each other. This awareness is more present when the transition between the spaces is smoother (Gehl, 2011), allowing a certain level of physical and/or visual connection between the two spaces. Different architectural styles and building typology also lead to different types of transition, and this can be easily seen in a common walk around any given city. Levi and del Rio (2016) categorize these transitions according to the presence and typology of walls, defining them as following:

No Wall: The smoother of all the transitions, where the delimitation is made only through marks and/or signs on the land, defining where a space starts and the other finishes. Stairs in front of administrative buildings, different pavements by large venues or even gardens are examples of these.

Fig. 3: The transition from the sidewalk to the house is clear, despite the lack of barriers.
Source: Google Street View (2017)

Symbolic wall: walls or fences that are not substantially tall (shorter than an average adult person), and are rather delimiting the space instead of providing protection to the property. The white wooden fence on suburbia from American movies are the best example of it. It is commonly seen also in houses built in Portugal around the 1950's.

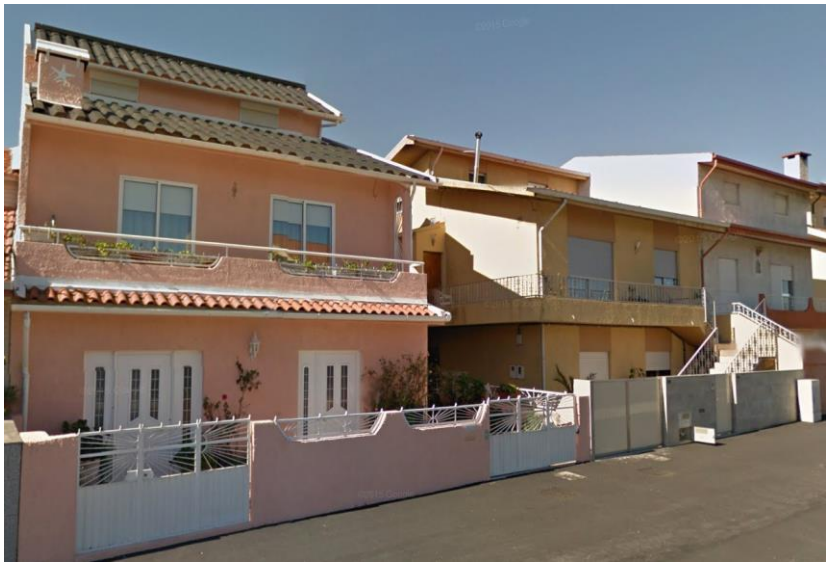

Fig. 4: Houses in Matosinhos, Portugal, with walls that define the limit but do not offer security
Source: Google Street View (2017)

Security wall: a barrier that has as primary goal to promote security and keep intruders or undesired visitors away. It does not necessarily block the visual connection between the spaces, but it is taller than the symbolic wall and is usually equipped with extra security/hazard components, such as broken pieces of glass, electric wires or barbed wires. Research has shown that this type of wall has increased efficiency in terms of preventing burglary crimes when neighbours are able to peak through the barrier and see what is happening within the walls (Ellin, 2003; Montgomery, 1998).

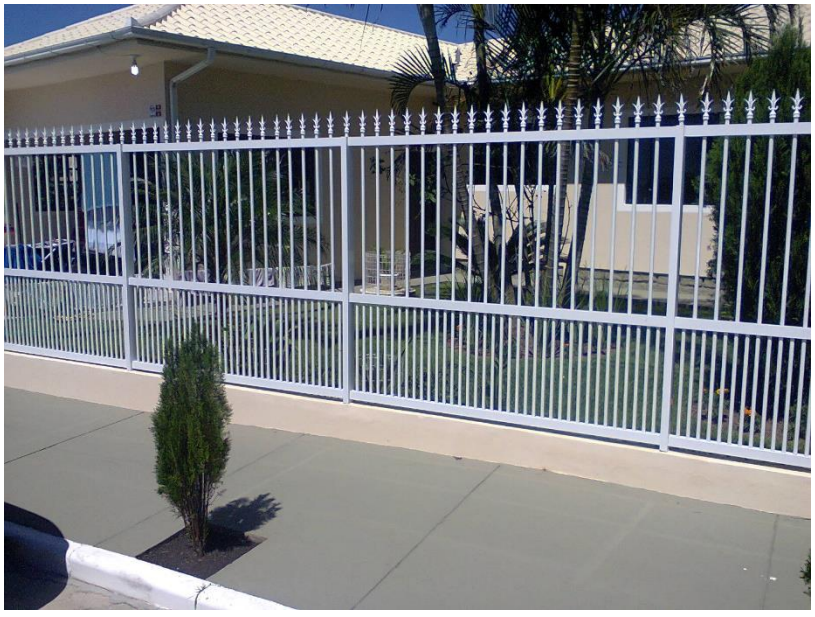

Fig. 5: A higher fence with spikes on top. Protection against intrudes, but neighbours can still see through.
Source: Orbital Alumínio (2017)

Privacy wall: this typology covers the aspects of the previous ones, with the addition of the function of blocking the visual connection between the edifice and the street. It is much higher than the symbolic wall, enough to create even a sound barrier from the streets, sometimes. It main function does not seem to be the provision of security (it lacks neighbour surveillance and the top protections), but it is not uncommon to spot walls that combine the traits of privacy and security types, becoming more similar to the fortress wall.

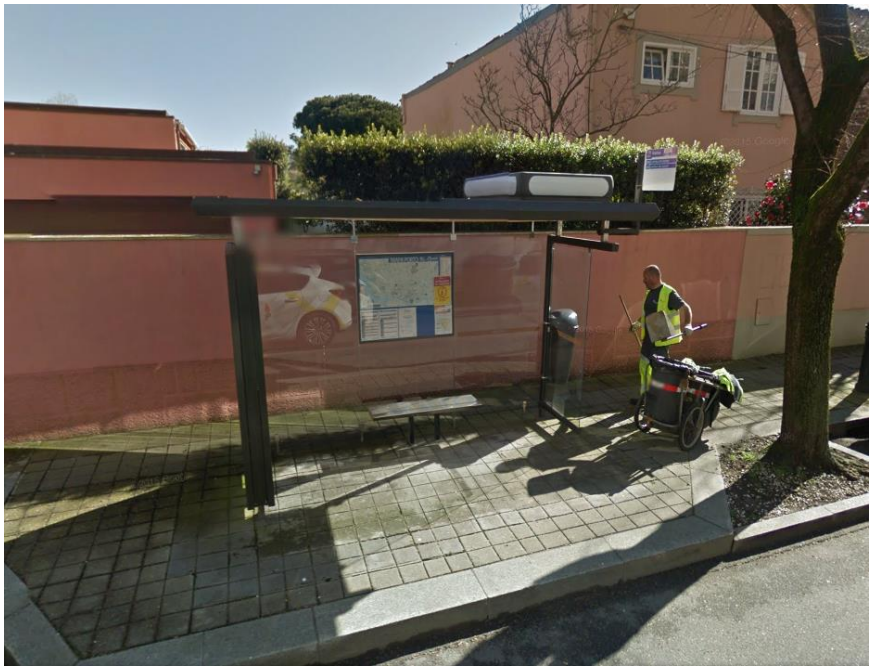

Fig. 6: The wall is taller than the man and it does not allow anyone to naturally look inside the property
Source: Google Street View (2017)

Fortress wall: Basically, a combo between security and privacy walls, but usually taller and more equipped with security measures, such as cameras for instance. It is commonly seen around very important embassies and recently became common around wealthy gated communities and mansions. It is usually placed also where the public security fails to provided enough safety, so it is easily sold as protection by the real estate market (which will be discussed further on).

Fig. 7: High wall, with security camera spotting who is at the gate. No interaction between the spaces.
Source: Google Street View (2017)

In addition to these types of division between public and private spaces, we can also identify cases in which the boundary role is played by the building itself. There are three main scenarios in which it happens, as it is noticeable in the following pictures:

Blind walls: This typology refers to buildings which facades offer no type of connection between the interior of the building and the public space. Any activity taking place inside the edifice is unknown to a person walking by, at the same time the occupants of the building are not aware of what is going on in the street.

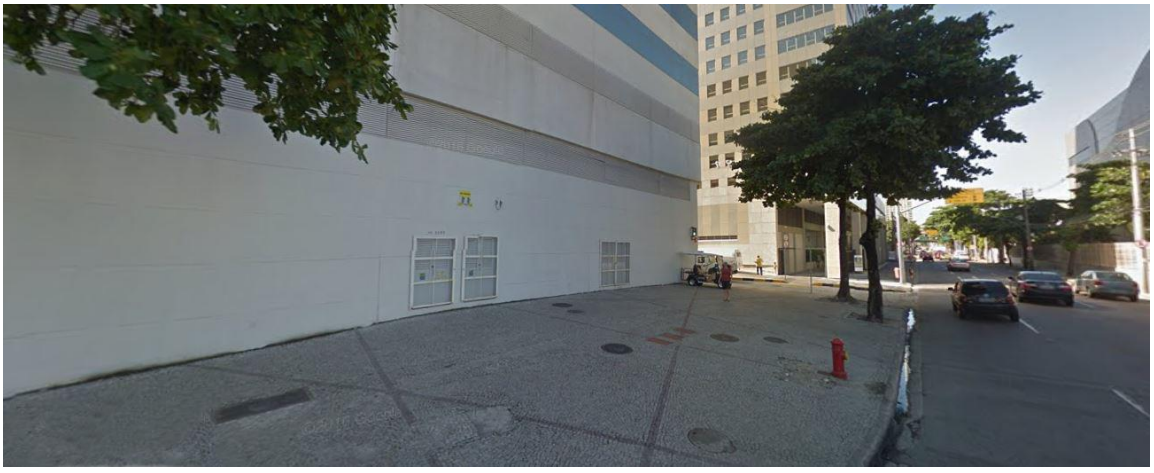

Fig. 8 Although the building connects directly to the sidewalk, the blind wall offers no interaction between the public and the private parcels.
Source: Google Street View (2017)

Active ground level: Described by Gehl (2010, 2011) as a key factor for successful public spaces, buildings with active floor levels offer a direct interaction between the public and the private space, both visual and physical. Passer-by's in the street and whoever is inside the building have easy access to what might be taking place on both spaces. Gehl and Svarre (2013) also point out that this type of construction leads to a higher occupation of the public space by pedestrians.

Fig. 9: Sequence of buildings with active ground levels. Open shops making the transition between public and private spaces, allowing high level of interaction between the spaces.
Source: Google Street View (2017)

Residential ground level: Similar to the typology described above, buildings with residential use facing directly the streets offer a certain level of interaction between the spaces, at least on the extent of what was described by Jacobs (1961) as "having eyes on the street". There is no direct physical interaction, but doors and windows allow awareness towards whether something or someone is present on the other space.

Fig. 10: Despite the absence of direct connection taking place between the spaces, the presence of windows at the floor level offer potential for vigilance and interaction.
Source: Google Street View (2017)

Again, it is relevant to observe that most construction types have one crucial thing in common: an actual connection between the public and the private space. It takes place either visually, like in the figure 10, through the presence of windows by the streets or even physically, like in the figure 4, when short fences just delimit the space, but do not create an actual barrier. Both examples have one characteristic first pointed out by Jacobs (1961), which is the presence of "eyes in the street": a direct visual connection between the public and the private spaces, enabling people to directly deal with the presence of strangers and, consequently, providing more safety. Jacobs also says (and this is widely agreed upon literature ((Carmona, 2010)), that keeping the public space safe is about creating a network of observers and spontaneous controls that behave according to what is commonly accept and/or imposed by the law. Therefore, when the connection between the private and the public space (and consequently its users) is lost or diminished, the number of observers and spontaneous controls is automatically reduced, and the presence of less people engaged on this civic task allows risk and undesired uncertainty, so barbarism can thrive (Bentley, 2004; Jacobs, 1984). This aspect will be of the utmost importance for the study carried out in this dissertation, and it will be brought back further in the text.

2.2 PRIVATIZATION OF PUBLIC SPACES

The landscape of the modern city has not always been public. On the first half of the 19th century, public services as policing, street cleaning, fire response and sewage in big American cities were private

owned (Low and Smith, 2006), and only after a big expansion on the demand for those services that the cities started to hire labour to deal with this so-called “urban issues”. This expansion of services provided by the public power led to the concept of public spaces management that we are nowadays accustomed to, and it is what allows public spaces to provide, theoretically access to everybody, regardless their condition. However, as previously mentioned, there have been waves of privatization of public spaces on the past decades (Lopes, 2015), and this has become a more relevant field of study (Fig. 11) due to the impacts it causes on the urban life as we know it.

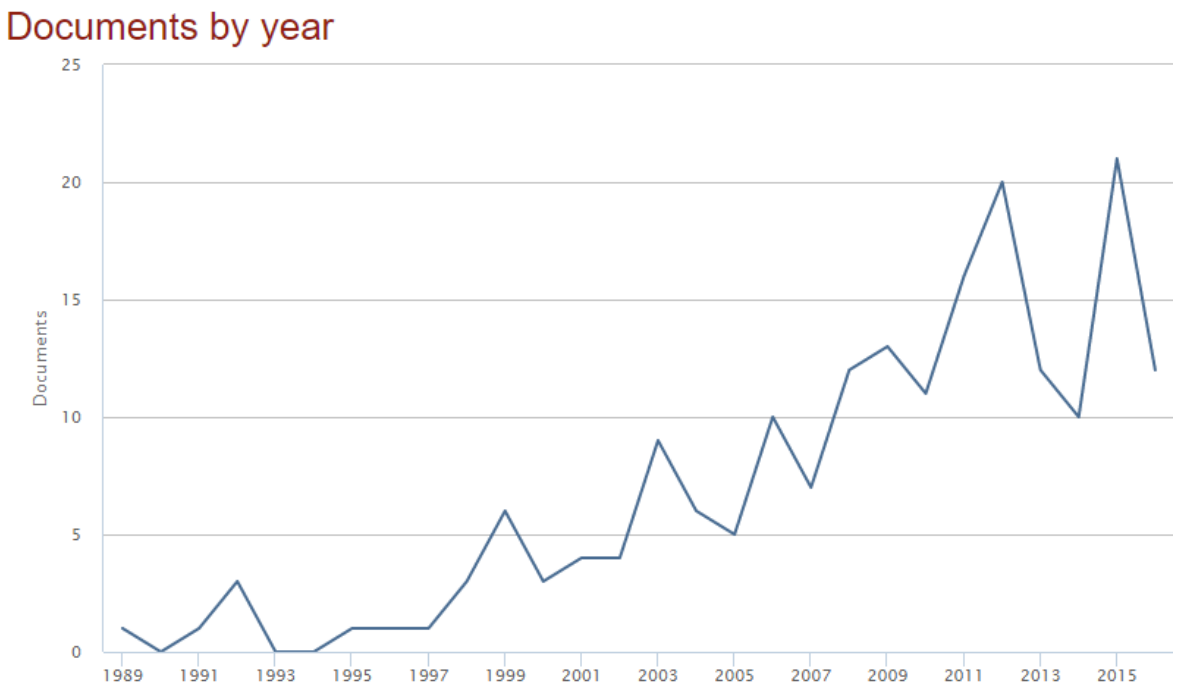

Fig. 11: Articles published with the words "Privatization" and “Public Space" on the title or abstract. Source: Scopus (2017)

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The privatisation of public spaces has grown substantially since the neoliberal period around the 1980’s and 1990’s, when private management was the overall tendency on the western world, after the crises on the welfare state pre-Thatcher and Reagan. The private interest taking over the public space turns the last into an asset for economic interests and commercial purposes which needed a series of improvements, thus a lot of redesign and reshaping took place aiming to achieve these outcomes. Those interventions lead to the creation of monitored streets, special policies for the usage of spaces, and restriction of access, which is now controlled by whomever owns or manages that spaces. The desire to have private control over public spaces is both a cause and a consequence of the death of those spaces. In addition to that, the access restriction promoted by these now “private spaces” leads to social

segregation and gentrification, once one of the main aspects of public spaces is the democratic and free-to-all possibility to use it (Carmona, 2010; Ellin, 1999; Low and Smith, 2006)

The diversity experienced in public spaces is thought to be a crucial fundament of democracy and social politics. The literature on urban studies has covered quantitatively and qualitatively how diverse encounters should take place in public spaces (Bodnar, 2015), and the polarization caused by the sprawl of privatized public spaces has affected how diversity takes place on public life. At the same time, we started to live in more connected and globalized world, which in theory allowed us to experience more and more diversity in a daily basis, nut mixed outcomes happened due to the death of the unpredictable public spaces. In a context in which diversity has become a treat to be avoided, due to the segregation of the public and the social abysm that neoliberalism created between working and middle class, it became possible observe a trend of abandonment of the public spaces, especially from those who could afford to do so, which has contributed to the expansion of those segregated private owned spaces, where access is restricted to just a few (Amin, 2006; Bannister 2015; Fyfe et al, 2006).

However, this phenomenon had further implications when the now willingly segregated middle class decided to reclaim the spaces that they themselves had retreated from, but perceived themselves as victims of "theft", as if public spaces had been stolen from them. From this moment onwards we started to see what Raco (2003) and Uitermark and Duyvendak (2008) call the revanchist city, with the uprising of gated communities and policies of urban cleansing, both attempts to design-out the undesirables and created once again safe - on their perspective - "public" spaces, frequented only by the "chosen ones".

In the past, we idealized the public space of the current urban centres as democratically undisclosed, fully open to anyone and equitable spaces where differences could be set apart, therefore emphasizing what we know as citizenship. However, what we experience nowadays are public spaces that highlight differences and boundaries instead.

Harvey (2012) presents this issue the connection with the concept of "right to the city", first elaborated by Lefebvre (1974). The idea that having the right to the city is not only being allowed to come and go as you please, but also to be able to shape the city not just as an individual, but as a community or a collective of people. The public space in its essence allows this constant and spontaneous metamorphosis triggered by the collective power, but the movement of privatization of public spaces made the access to the space and the ability of reshaping it a right that is only given to those who can pay for it.

2.3 THE CITY BETWEEN WALLS

The revanchist city is partially a response to the fear of crime, real or imagined, and to understand how it turned into a movement of building wall it is necessary to understand the specifics of the market for security (Helsley and Strange, 1999).

2.2.1. REAL ESTATE "INNOVATION"

Already in the beginning of the 1990's, Shavell (1991) pointed out that the private expenses with security in the U.S.A. were already higher than the money invested by the public power to deal directly with public safety. This shows that from that point was already possible to observe that people not only have a demand for private security and exposure to crime (McDonald and Balkin, 1983), but also are willing to pay big money for it. This was, of course, a solid opportunity for the real estate market to act upon.

The innovations presented by the real estate market shape the cities before urban planners' decision making is able to do so (Weiss, 2002), therefore the impact caused by those new typologies of houses and building developments appear much quicker than the public power is able to cope with them, unless they are foreseen. One of the more game-changing innovations of the past decade was to sell security and safety. Benefiting from the opportunity granted by the revanchist middle-class, that had money and was willing to create and use new safe-spaces instead of using the old public and now dangerous and violent spaces (violent crime had a peak around the 90's, especially in the USA (Federal Bureau of Investigation, 2015; Statistical Office of the European Communities, 2016)), the real estate market could introduce security and safety as new aspects of their developments, and profit from that. Under this context, we witnessed the creation and rise of gated communities, and privacy and fortress walls starting to be perceived as positive traits for housing, along with the consequences and impacts of this new way of building cities and dealing with the transition between public and private spaces.

2.2.2. FORTIFIED ENCLAVES AND PRIVACY WALLS

The development of gated communities is deeply covered in the literature, especially in the United States and in developing countries. This might be due to the fact we have observed a higher, faster and more damaging process of gating in those areas, mainly where urbanization was not public responsibility in the past decades, but rather left under the control of the private sector (do Rio Caldeira, 2000).

There are two fundamental features associated to gating and building privacy walls, and it is part of the common sense that those directly benefited by such action are the residents within the gates. One of these features is the ease with which one can point it out (Helsley and Strange, 1999). Given the fact

that this typology of walls will always be high and imposing, it is promptly observable by the people on the streets - criminals included -, and according to Shavell (1991) observability plays a major role on crime prevention, once it is capable of dissuade and redirect criminal activities.

Another feature and maybe the most important one is that gating is ultimately geographical. Building a wall has been, and will always be, a matter of divide the territory and create a geographic variation of the level in which an activity – desired or not - is carried out. This allows us to understand the reason why, for instance, gating has thrived so strongly in countries with high income and social inequalities (do Rio Caldeira, 2000). Different social groups (the richest) want to be geographically apart from the poor and - on their point of view - the dangerous, so they (or the real estate developers, the ones now "responsible" for the urbanization) use walls as their personal and private solution to do so.

There are, however, impacts associated to gating. Shavell (1991) addresses the fact that crime is pushed away to other areas with no gating, which is an undesirable externality at the city scale, and since this is not taken into account by the developers, excessive gating is used as a strategy to always try to push crime away, and this is enhanced when policies related to public safety stimulate private expenditures and solutions to reduce crime.

do Rio Caldeira (2000) has a large study on gating focused on the Brazilian case, where she says gating has appeared as a social and physical structure, triggered by the democratization which follow the dictatorial period between 1964 and 1986. While civil rights were expanding in the new resuscitated democracy, the denial towards the former power structures, the mistrust in the institutions, the lack of regulation towards the public realm and the legacy of human rights abuse perpetrated by the military regime, they all contributed to the appearance of higher walls and mainly gated communities, since they represent not only a physical barrier, but also a way to keep the "undesired" and the "dangerous" away. This type of analysis is much associated to safety and crime, and this nuance will be investigated further in this literature review.

The structure of gated communities and house with privacy or fortress walls is intended to provide a refuge and to promote – sometimes- active defense. It is curious that these typologies of construction, the ones which aim for these two traits, usually emerge in circumstances in which central governments are weak, or at least not capable or willing to intervene in public safety. This pattern dates back to ancient Rome, during the *Pax Romana*, when there was no need to build protection walls in smaller towns, and further in the future, during the medieval period, the lack of a central and protective government led to the building of castles and fortified towns, due to the fear, threat and risk of raids and invasions (Adkins and Adkins, 2014; Nesbitt, 1996). In certain ways, gated communities follow a very similar logic: as they thrive under weak government contexts, they focus on protecting their own piece of land in order

to keep the interest of its inhabitants and developers - the high land value-, and this is done through building walls.

The decision-making process of spending money on individual protection such as building a fortress wall or buying a house in a gated community includes our perceptions that any precaution to reduce theft is positive, since we tend to overlook negative externalities towards others. In addition to that, connecting to the empirical evidence that these building typologies appear more often in scenarios with weak governments that provide a low - feeling of – safety, there is also the fact that we are, in general, "*conditional co-operators and altruistic punishers*" (Gintis, 2005), which means we tend to act considering the common good, but only if we feel like the system is fair and pays-off. The application of this mentality is easily seen in communities where there is a strong collectivist culture: they are less likely to develop gated communities and privacy walls because there is more trustworthy social integration (Levi and del Rio, 2016), and this does not apply only to private homes, but it is reflected even at the government level: Public and governmental buildings in secure collectivist democracies are usually open and have easy access to the public, while those in more strict governments, where there is no trust between the rulers and the people, are concrete-made demonstrations of authority, superiority and power.

Fig. 12*:* Icelandic (top) and Romanian (bottom) parliament buildings. The building typology passes the message of what is the desired level of integration
Sources: Morin (2015) and Donteville (2012)

2.4 PUBLIC SAFETY

2.4.1. REAL SAFETY VS PERCEIVED SAFETY

The way public spaces are used and how they look like associate to the user's perceived safety (Henderson *et al.*, 2016), and even though the data shows a general decline in criminality (Statistical Office of the European Communities, 2016; Valera and Guàrdia, 2014) it is noticeable that the population feels otherwise. (Braakmann, 2016; Cossman and Rader, 2011; Shavell, 1991; Valera and Guàrdia, 2014), for instance since in 1991 the private expenditures with security had already outpaced the public ones (Shavell, 1991). When the streets are perceived as unsafe, there is a positive feedback that leads to more risk outside, because if having more people on the streets leads to more safety - sidewalks constantly occupied by people attract more attention, and therefore more safety (Jacobs, 1961) -, the opposite is also true: empty streets are less safe streets.

It is widely mentioned in the literature that occupied streets are safer, and to inquiry the reasons why they are being used or not it is necessary to take a step back and be aware that in order to have those streets (and public spaces) taken over by people it is necessary to provide the users quality spaces. People need to feel invited to occupy public spaces (Gehl, 2010), and this is of the utmost importance on the subject of public safety.

The attractiveness of the space will have a strong influence on how it will be perceived by its users, but the direct relation between the urban appearance and certain socioeconomic outcomes derived from it is considered hard to study. This happens due to the subjectivity and lack of data on urban appearance, since the current methods for studying it are expensive, time consuming and cannot cover large areas of study (Naik *et al.*, 2016). However, empirical data shows that there are traits that influence the usage and occupation of spaces (Gehl and Svarre, 2013), and this will also impact both perceived and real safety on those spaces.

The difference between real and perceived risk (or safety) has been a subject of study in many fields, from retail shopping (Sweeney *et al.*, 1999) to extreme events (Slovic, 1993), covering aspects as internet baking (Lee, 2009), nuclear energy (Pijawka and Mushkatel, 1991), among others. Our theme of discussion is also included in this long list, mainly associated with fear of crime (de Vroome and Hooghe, 2014; Lieser and Groh, 2014; Mason *et al.*, 2013; Valera and Guàrdia, 2014), which will be also the approach used in this dissertation.

Fear of crime is a leading force in people's decision making and it can be triggered by a vast range of causes, widely covered in the literature and usually associated to economic aspects such as unemployment, weak welfare, and income inequality, but also with contributions made by the social

sphere like emotional interpretations of society and vulnerability to the media and the content spread by it (Dowler, 2003; Hollway and Jefferson, 1997; Hummelsheim *et al.*, 2011; Temelová *et al.*, 2016; Valera and Guàrdia, 2014). Yet, regardless of the cause, all studies agree that perceived risk (fear of crime included) is much associated with the feeling of uncertainty, and that it causes impact on socioeconomic behaviours, shaping society accordingly.

The previously mentioned centre of the discussion here is that we have witnessed an increasing fear of crime, despite all the data and reports showing that the risk of crime has been decreasing over the decades. Even harsher information is that even though less people are subjected to crime or are victims of criminal activity, more people tend to admit that they fear being at public spaces (Valera and Guàrdia, 2014).

It is well accepted that there is a direct correlation between the existence of crime and disorder in the territory with the perceived safety and fear of crime in that same space and its surroundings (Brunton-Smith and Sturgis, 2011), and some studies say there is no directly correlation between higher concerns about crime and engaging in "dangerous activities", such as walking alone at night (Forde, 1993; Oh *et al.*, 2010). Even if perceived safety is a subjective feeling, its causes can rely on the actual risk present in one's life. Such aspect points out that how people feel and perceive safety has a bigger impact on their behaviour than the actual crime rates (Mason et al., 2013; Temelová et al., 2016). However, the existence of fear among citizens who are exposed to low or none crime rates exposes a different problem, one that is more associated to personal anxiety and it brings consequences, even on the matter of real safety, when acted upon. One example is the previously mentioned externalities caused by gating areas. The safety on the public realm can be decreased when a safe place is reshaped to provide less risk to properties. If this place was already "safe enough", the global safety can be now lower than before (Shavell, 1991).

The existence of fear is strongly moderated by economic disparities between the actors involved: the threatened and the potential offender (Brunton-Smith and Sturgis, 2011; Valera and Guàrdia, 2014). According to Maricato (1996), high and middles classes have lack of knowledge about the city, once they are more likely to be isolated from it in many aspects of the city life: The wealthier tend to live within their "fortified enclaves" (do Rio Caldeira, 2000), move around in their private cars and live a sort of life away from the public spaces. This unawareness potentializes the feeling of risk and reduces the perceived safety, very much associated to the fact that we, as human beings, tend to be afraid of what we are not familiar with (Moreland and Beach, 1992).

Perceived safety is very much connected also to the general aspect of a place. The overall attractiveness, tidiness and appearance of the spaces influence the perception users will have. This was

first stated in the literature on the well-known work developed by Wilson (1982), with the "broken windows" theory: Areas which seem to be well taken care of and demonstrate low level of so called incivilities are more likely to be perceived as safe. Incivilities can be crime *per se*, but here what we mean by this expression are the more visible and apparent traits that expose unfriendliness, unreliability, low levels of care, and respect for the community or neighbourhood. Therefore, in general, those incivilities express more information about the potential risk an area can offer than the actual criminal activity, since the first is constantly visible to anyone, while crime takes place in a more discrete way in time (Mason et al., 2013). In other words, people are more sensitive to what seems to happen in a location based on visual judgment backed up by their own biases than to actual risky and unsafe situations which might take place.

Besides the socio-economic variables that influence on perceived safety, some authors also point out the role of neighbourhood satisfaction in affecting people's feeling of insecurity. Factors such as identity, attachment to the place and residential satisfaction have not only an effect on one's general psychological health, well-being and quality of life, but are also linked to how one feels safe in their household. The hypothesis investigated by them was that people who have more concerns about depreciation of the public realm and therefore had less or weaker attachment to those places were more likely to report fear of crime (Di Masso *et al.*, 2011; Franc *et al.*, 2012; Innes, 2004; Taylor, 1996; Vidal *et al.*, 2010).

At this point it is crucial to note that many of the aspects covered here are interconnected and create a positive feedback on deterioration of public spaces and their safety: low quality public spaces (for instance the ones taken over by cars) lead to less attractiveness, less occupation and fewer interaction between people and classes, which increases the perceived risk - mainly be the wealthy - on those locations. This worse feeling of safety creates demand for more security, which can be quickly provided by the real estate, which pumps up the expansion of gated communities and privacy walls. Furthermore, areas with gated communities and privacy walls pass an image of insecurity (one can easily associate high need for protection as an incivility), which will again decrease the perceived safety: the process works not only as a cycle, but as a magnifying one, creating a snowball effect.

This hypothesis is back-up by models used by authors such as Carro *et al.* (2010), connecting gating to deterioration of the public realm, as it is a pattern of occupation of the public space and therefore has an impact on the creation of a (un)safe environment. We can see the direct correlation pointed out on the representation below:

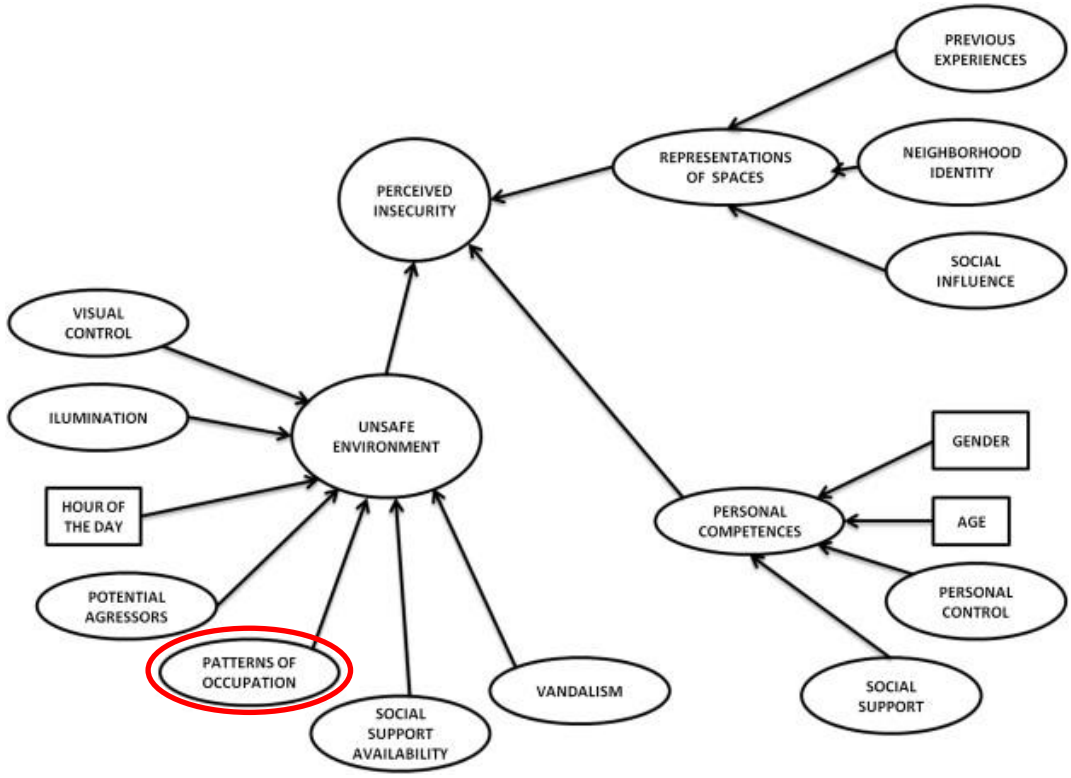

Fig. 13: Gating (a pattern of occupation) can contribute for an unsafe environment, which influences one's perceived insecurity.
Source: (Carro et al., 2010)

The debate around perceived safety is largely present nowadays on Europe, very much because of the idea of constant terrorist threat, associated with the presence of immigrants on the continent, and the relation between ethnicity and certain forms of crime (de Vroome and Hooghe, 2014). This type of feeling – either applied on migration/terrorism, or in a wider sense of approaching fear of crime in not so risky environments – it has been linked to the concept of "post-truth". Chosen by the Oxford Dictionary (Oxford Dictionaries, 2016) as the word of the year 2016 and widely associated to politics, the notion of post-truth is that individuals choose to believe in ideas that are not entirely backed-up by real facts, studies or data, but are rather perpetrated by fake information or feelings that are coincident with their own biased previous point of views (Gross, 2017; Kucharski, 2016; Lockie, 2017; S. Wilson, 2016).

We can notice the same pattern on the sphere of real versus perceived safety: regardless the absence of crime, data showing that crime is not existent in determinate areas, and the trends of constantly decreasing criminality, people are sometimes still fearful and perceive themselves in risky environments, and even believing that the future prospections are negative and that crime will increase. One example of this is Portugal: on the last public survey about safety and security, even though 73% of the respondents consider themselves living in a "safe" or "very safe" country, 56% of them said the

safety has worsened in the past year and 48% believe that it will get even worse in the future (Esegur, 2014). Portugal, in the other hand, is considered the 5th safest country in the world, according to the Global Peace Index (Institute for Economics and Peace, 2016).

2.4.2 CRIME

The consensus on the urban planning field that occupied streets promote safety due to the higher presence of eyes on the streets that create a kind of constant surveillance is not shared by criminologists when it comes to the subject of burglary crimes (Sohn, 2016). The presence of mixed-use land use, for instance, is considered by some criminologists as an attractor of outsiders, and those are more likely to be potential offenders who might carry out crimes against properties (Kinney *et al.*, 2008; Kitchen and Schneider, 2007).

However, studies show that different typologies of use lead to different outcomes. On the literature is possible to observe that land uses that attract either too many (like shopping and retail) or too few people (just residential) are more associated to crimes, and this can be true due to two reasons: First, burglars have in mind the likelihood of being sported or heard while performing a crime, which is less likely to happen when there is no one on the streets; and second, large crowds provide the benefit of the anonymity. If everybody is unknown to everybody, the chances that a break-in will pass unnoticed are higher, once the people passing by do not know who lives in this or that specific house. (Nee, 2015; Sohn, 2016; Wilcox *et al.*, 2004). The opposite happens with the presence of small business, restaurant and grocery shops: once those are activities that attract more local people who reside in their vicinities (Ekblom, 2011; Jiao *et al.*, 2011), the surveillance and the eye for suspicious activities is sharper.

As previously mentioned, not only different patterns of use but also distinct forms of occupation contribute for different levels of fear of crime, once they affect how the people perceive the environment around them and how safe they fell around there. Furthermore, studies show that those patterns of occupation have also influence on the real safety of a determined area. For instance, studies show cases in which lower density, with sparse distribution of households, as we can observe on the suburbs, presented a lower incidence of street crime in comparison with dense central urban agglomerations. However, these very same typology was more likely to experience burglary and property crime (Hakim, 1980; Hwang *et al.*, 2017; Temelová et al., 2016).

Considering that the decision making process associated to committing a crime takes into account risk, ease and reward, the building elements play a significant role on this process (Hwang et al., 2017), especially on the matters of ease and risk. Ease because certain types of buildings (or walls and fences) can make the action of breaking in more complicated; and risk of being caught, which is smaller if, for instance, there are non-see-through walls (Levi and del Rio, 2016). When it comes to street crime, in the

other hand, its occurrence is also linked to the analysis of risk, ease and reward, but risk and ease are not only connected to the risk of being caught, but also associated to the victim of the assault and how or if they will offer resistance. Naturally, the built environment plays a role on this scenario, once it can provide safer or more dangerous spaces for criminal interventions to take place.

2.5 LITERATURE REVIEW'S CONCLUSION

We could observe in the literature review that our behaviour is very much associated to the conditions of the environment that surrounds us, and even though such logic is easily understandable, we lack the capacity of understanding how our decisions, as an individual or as a group, would affect third parties. Dealing with our private space (the one within our own property) is an expression of our freedom, and how we decide to protect our private spaces or connect them to the real world shapes the structure urban fabric, and this concrete habitat we live in is where most of activities and interactions are supposed to take place in our society. Therefore, it is important that we learn how these decisions at personal level affects one's perception and comfort. Or in other words, the ability to feel safe, which is one of our fundamental needs as human beings.

This is the goal of this study. Within its limitations, it aims to associate one´s perceived safety with the type of transition between the public space in which they are (virtually) present, and the private spaces that surround them.

3

METHODOLOGY, AIM & OBJECTIVE

3.1. AIM

The motivation behind this project lies on the fact that Portugal has seen its walls rising throughout the last half century - even evidenced by the national regulation on urban edification (RGEU, in Portuguese) -, but it is not certain if such phenomenon brought higher safety (real or perceived) to the population.

Therefore, this Master Thesis aims to investigate the relationship between perceived safety and the typologies of transition between public and private spaces.

In order to reach this aim, the following specific objectives are to be conducted during the development of the thesis.

3.2. SPECIFIC OBJECTIVES

1. Collect information about people's perceived safety under distinct stimulations;
2. Connect the data about perceived safety with different variables related to the characterization of public spaces;
3. Measure the impact caused by the prominent variables and focus on the role of the boundaries on one's perceived safety and fear of crime.

3.3 INVESTIGATION & QUESTIONNAIRE

The methodology which was carried out in this study was based on methods previously used by researchers from the university of Porto on the field of criminology and urban studies (I. Guedes, 2012; I. S. Guedes *et al.*, 2015) to investigate not only perceived safety, but also the individual perception towards different spaces.

A series of images (photographs and imagery from Google Street View) of buildings were selected according to their typology of transition between the public and the private space, taking into consideration 3 aspects in each one of them, listed from A to C:

- A: Typology of the boundary: "0" for absence of it; "1" for symbolic walls; "2" security walls; "3" for privacy walls; and "4" for fortress wall, "5" for when a building with active ground floor works as a boundary;
- B: Width of the space dedicated to pedestrians in the public space: "0" for absence of it; "1" for narrow sidewalks; "2" for wide sidewalks; and "3" for pedestrian streets
- C: Visual upkeep level: "0" for low levels of degradation; and "1" for high level of degradation

However, in order to build a questionnaire with a reasonable size for the respondents, it was decided that only the aspects A (typology of boundaries) and C (visual upkeep) would be the control variables, allowing the listing of only 12 different scenarios with all possible combinations between the classifications listed above. When it comes to the aspect B (width of the space dedicated to pedestrians in the public space), the chosen images were randomly selected according to this trait.

In addition to these aspects, it was decided that some other traits regarding the public space should be included on the investigation, once they might have influence upon one´s perception of safety and/or fear of crime. The reason this we included these traits on the questionnaire lies on the need of having a way to test our hypotheses that visual upkeep and boundary typology will play an important role on the perceived safety. Therefore, we asked to what extent each of the following factors influenced the evaluation of each image:

- Width of the space dedicated to pedestrians
- Building upkeep
- Public space upkeep
- Type of vegetation
- Building height
- Type of transition between the building and the street
- Presence of graffiti
- Absence of people in the streets

The reason behind the aspects listed above were chosen is the fact that they are constantly present in the literature discussing perceived safety and transition between public and private spaces (Lopes, 2015). The specificities of this aspects and how they are understood and seen by the academic

community were covered in the previous section of this study, therefore their use is justified as relevant for the investigation. The main objective behind presenting a range of options is to compare them with the item "Type of transition between the building and the street" allowing us to see if it is seen by the respondents as a factor as much as, more, or less relevant to the rating of safety than the other well-known factors.

Furthermore, in order to investigate people's perception of safety on each case it was asked from volunteers to imagine themselves at the location portraited in the picture, then four questions were presented to the respondents: How pleasant was the location showed in the image; how intense was that image; how safe they would feel in that situation; and how likely they thought it was to be victim of crimes in that location.

The questionnaire used in the study was shared virtually among students, teachers and the rest of the community of University of Porto (Portugal) and Polytechnic School of Federal University of Rio de Janeiro (Brazil). The formulary was available to the respondents for 5 days though Google Forms online platform.

On the figures 14 and 15 below we can see the structure of the questionnaire and how it was presented to the respondents, using as example the first of the twelve cases to be analyzed by them. This case portraits the scenario with privacy wall and high upkeep level. The other cases are in the annex 1.

It is relevant to mention that the language chosen for the survey was Portuguese, because it is the official language of the two countries in which the questionnaire was made available. The English version below represent a translation of the questions used in the published version.

Case 1

This questionnaire aims to quantify and qualify perceived safety in situations which different types of transition between public and private spaces are presented.

Imagine being at this place:

In your opinion, how pleasant is this space in a scale from 1 to 9? *

	1	2	3	4	5	6	7	8	9	
Not at all pleasant	○	○	○	○	○	○	○	○	○	Very pleasant

How would you rate the intensity of this image from 1 to 9)

	1	2	3	4	5	6	7	8	9	
Low intensity	○	○	○	○	○	○	○	○	○	High intensity

On a scale from 1 to 5, how safe would you feel? *

	1	2	3	4	5	
Highly unsafe	○	○	○	○	○	Highly safe

Fig. 14: Questionnaire presented to the respondents (part 1)

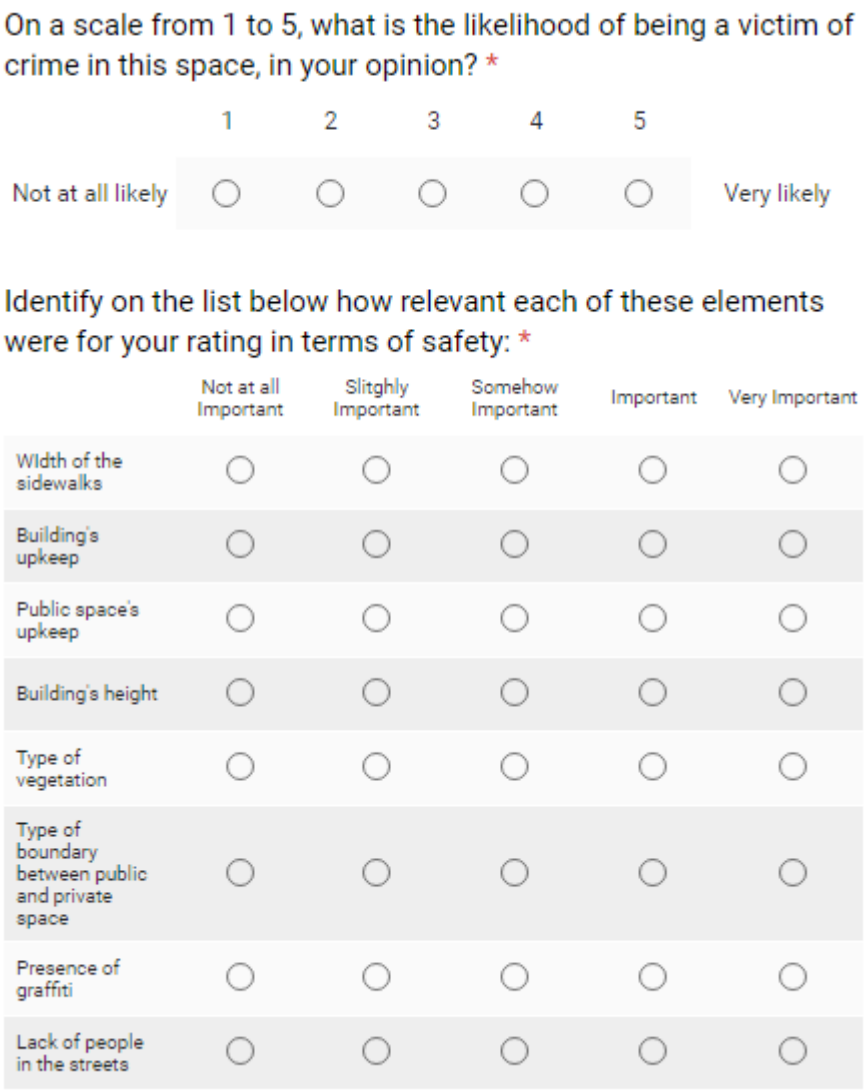

Fig. 15: Questionnaire presented to the respondents (part 2)

In addition to that, the respondents were asked about their nationality, gender, and age, to gather a few sociodemographic traits to be analyzed in the study. Even though the sampling of respondents is limited to those in the university environment, it was decided that it would be interesting to evaluate the data according to different sub groups, due to possible variations on the results.

Another item present on the questionnaire was the question inquiring if the respondent was a victim of crime recently. As presented in the literature review, people who experienced crime are more likely to express lower levels of perceived safety than those who have not. Therefore, this input presents itself as valuable for the investigation, allowing the possibility of weighting its influence on the outcomes of the survey.

As mentioned above, twelve cases with the possible combinations between the six different boundary types and two different upkeep levels were presented to the respondents, and they were placed randomly in the questionnaire. The order in which they were presented was the following:

- **Case 1:** Privacy wall and good upkeep level
- **Case 2:** Active ground level building and bad upkeep level
- **Case 3:** No wall and good upkeep level
- **Case 4:** Active ground level building and good upkeep level
- **Case 5:** No wall and bad upkeep level
- **Case 6:** Fortress wall and good upkeep level
- **Case 7:** Symbolic wall and good upkeep level
- **Case 8:** Fortress wall and bad upkeep level
- **Case 9:** Symbolic wall and bad upkeep level
- **Case 10:** Privacy wall and bad upkeep level
- **Case 11:** Security wall and good upkeep level
- **Case 12:** Security wall and bad upkeep level

Hereinafter the cases will me mentioned according to this numbering, referring to its classification only when it is necessary.

3.4 DATA TREATMENT

Before presenting the results obtained with the questionnaire it is important to point out the methods used for the treatment of the data collected during the investigation.

After the survey was finished and the reply were extracted from the online platform, the software MS Excel and IBM SPSS were used to refine the data and prepare it for the statistical analysis that would follow.

Three main statistical methods were used in the analysis: Oneway Anova and Post Hoc Tukey-B Tests to identify similarity among variables and cases; and Univariate Analysis of Variance to build a model that uses explanatory variables to describe one dependent variable - in our case, perceived safety. These methods were chosen due to the fact that they describe efficiently the correlations between the type of data collected in this survey, working with the averages and variances obtained from the replies (Oneway Anova and Post Hoc B-Tukey's) and testing the effects of different subjects on the desired variable of study (Univariate Analysis of Variance)

4

RESULTS

The formulary was available to the respondents for 5 days though Google Forms platform and it received a total of 428 replies, divided according the following sociodemographic aspects presented in the figures:

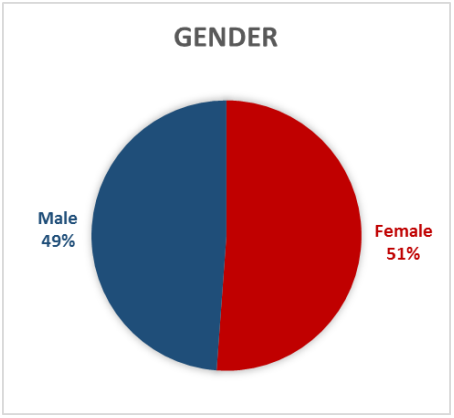

Fig. 16: Gender distribution of respondents

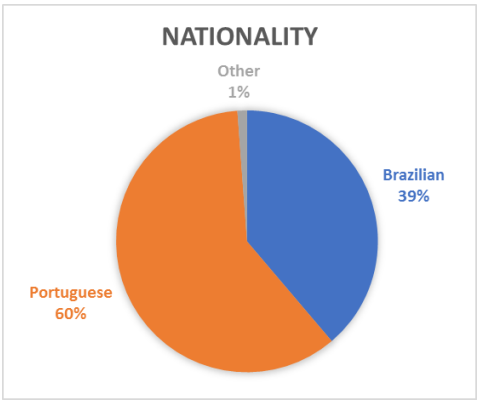

Fig. 17: Nationality distribution among respondents

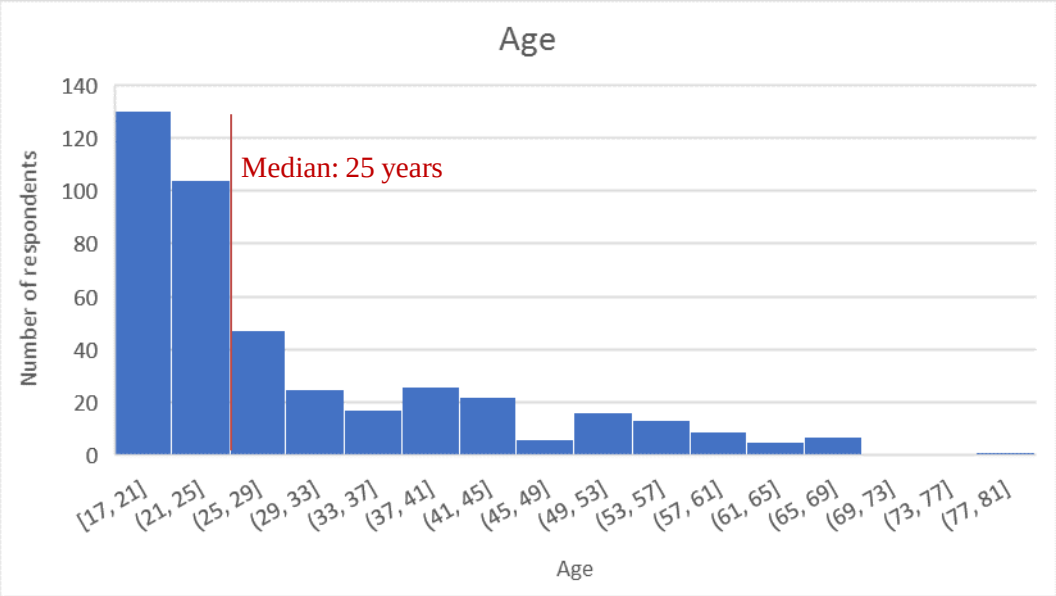

Fig. 18: Age distribution of respondents

It can be noticed in the figures above that the clear majority of the respondents were Portuguese and Brazilian, most of which of young age. This scenario was expected, since the questionnaires were divulgated amongst university students in campuses located in those two countries and it was presented in Portuguese language.

When it comes to the proportion of people who were victims of crime in the past 12 months, we can observe that 72,8% of the respondents have not suffered any type of criminal action, while the other 27,2% were victims of crime recently. It is interesting to point out that this ratio changes drastically according to the nationality of the respondents: 41,5% of Brazilians have been victims of crime, while only 18,2% of the Portuguese have been through the same situation in the past year. Again, such difference was expected since crime rates in Rio de Janeiro are significantly higher than those in Porto (Instituto de Segurança Pública, 2017; Instituto Nacional Estatístico, 2016). Another trait that stands out in the dataset is the men were more affected by criminal activities then women. While 20,5% of women (regardless their nationality) declared that they were victims of crime recently, this number goes up to 34,4% when we look at the male replies. This result is not conclusive nor was expected, since the number of replies from both sexes were approximately equal. However, since this is not within the scope of the study, this aspect shall not be investigated more deeply.

In order to present the results in a simpler and more understandable way, the cases will be grouped according to the typology of transition or upkeep level, allowing a better visual comparison between the different cases. For starters, we shall inspect individually each of the 4 main questions presented to the respondents, for each type of boundary analysed.

4.1 PLEASANTNESS

In the cases 3 (good upkeep) and 5 (bad upkeep), when there are no walls, the average scores of pleasantness were 4.28 and 2.57 respectively, in a scale from 1 to 9 (T-test 2-tailed significance = 0.000). The frequency of the replies can be seen in the figure below:

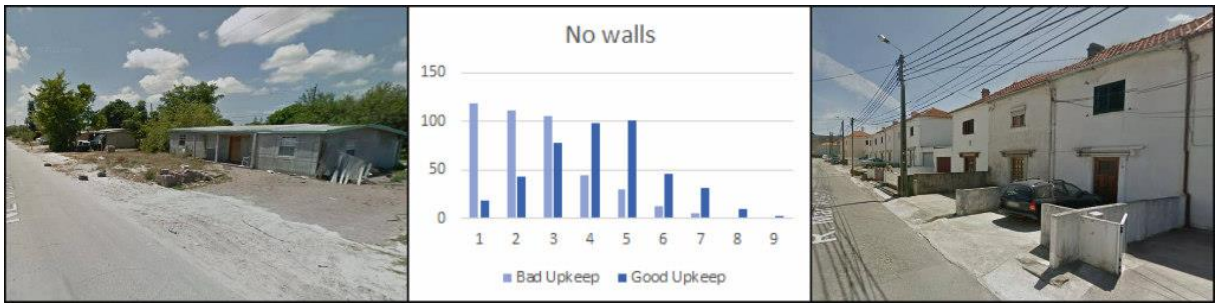

Fig. 19: Frequency of replies for pleasantness in the cases with no walls. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right

In the cases 7 (good upkeep) and 9 (bad upkeep), when there are symbolic walls, the average scores of pleasantness were 5.05 and 3.54 respectively, in a scale from 1 to 9 (T-test 2-tailed significance = 0.000). The frequency of the replies can be seen in the figure below:

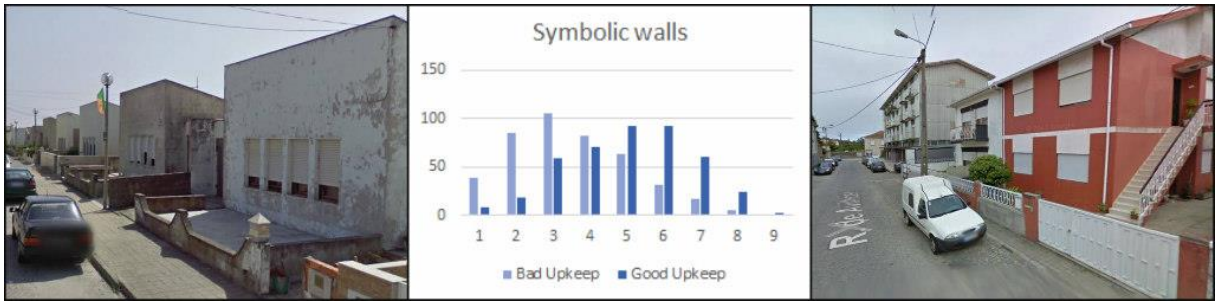

Fig. 20: Frequency of replies for pleasantness in the cases with symbolic walls. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right

In the cases 11 (good upkeep) and 12 (bad upkeep), when there are security walls, the average scores of pleasantness were 6.34 and 3.74 respectively, in a scale from 1 to 9 (T-test 2-tailed significance = 0.000). The frequency of the replies can be seen in the figure below:

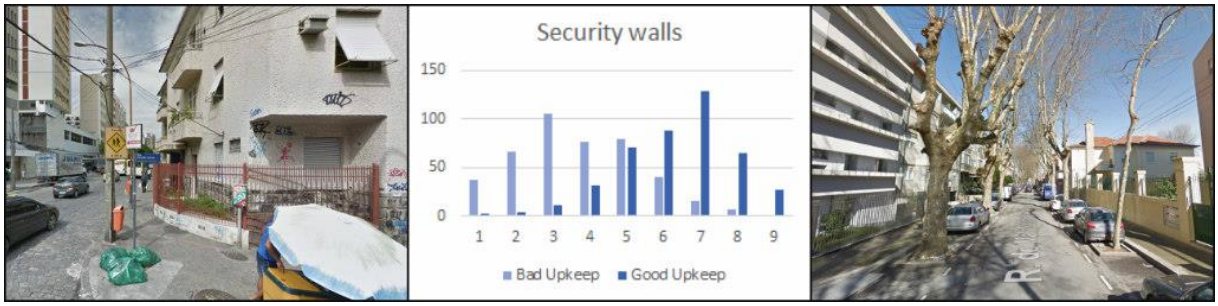

Fig. 21: Frequency of replies for pleasantness in the cases with security walls. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right.

In the cases 1 (good upkeep) and 10 (bad upkeep), when there are privacy walls, the average scores of pleasantness were 7.35 and 4.62 respectively, in a scale from 1 to 9 (T-test 2-tailed significance = 0.000). The frequency of the replies can be seen in the figure below:

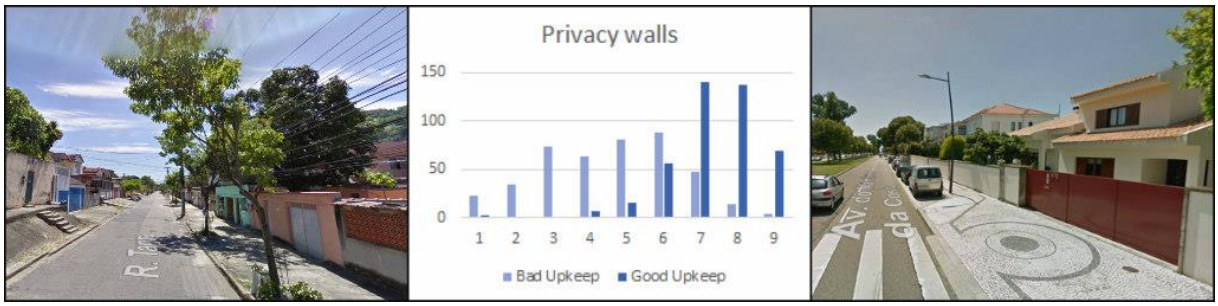

Fig. 22: Frequency of replies for pleasantness in the cases with privacy walls. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right.

In the cases 6 (good upkeep) and 8 (bad upkeep), when there are fortress walls, the average scores of pleasantness were 3.84 and 2.64 respectively, in a scale from 1 to 9 (T-test 2-tailed significance = 0.000). The frequency of the replies can be seen in the figure below:

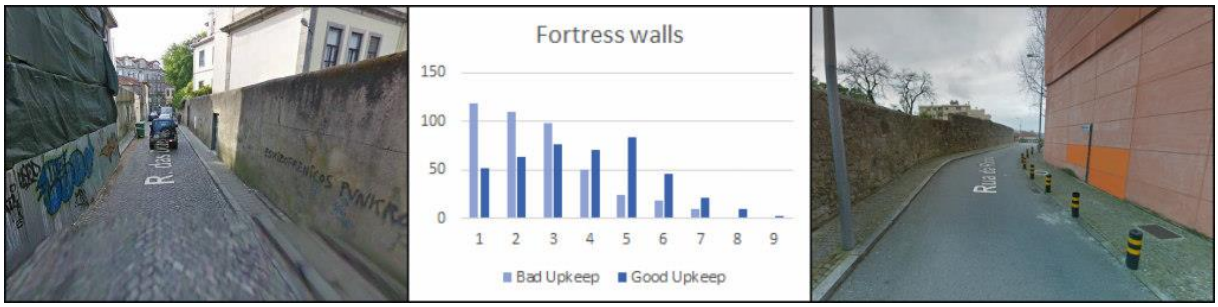

Fig. 23: Frequency of replies for pleasantness in the cases with fortress walls. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right.

In the cases 4 (good upkeep) and 2 (bad upkeep), when there is active ground level, the average scores of pleasantness were 7.34 and 4.74 respectively, in a scale from 1 to 9 (T-test 2-tailed significance = 0.000). The frequency of the replies can be seen in the figure below:

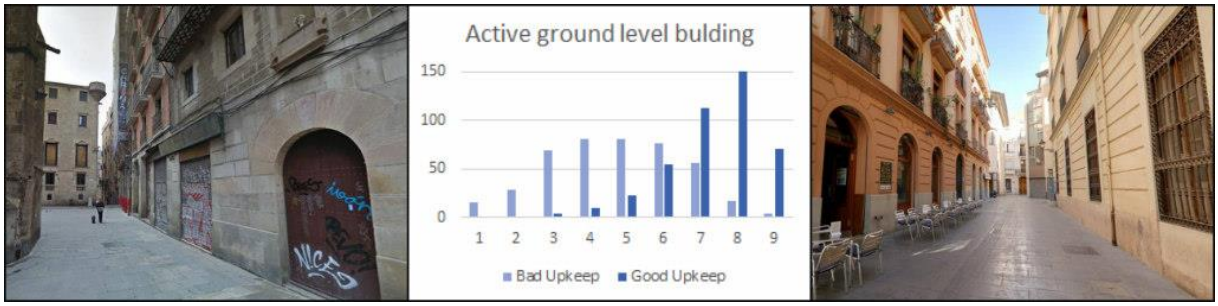

Fig. 24: Frequency of replies for pleasantness in the cases with active ground level buildings. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right.

We can observe a clear pattern in these results presented above: the influence of the bad upkeep in the pleasantness of the space. Looking at the charts it is possible to see that the bars representing the highest frequencies of reply shift from left (low scores) to right (high scores) when the upkeep improves. This result is not a surprise: as we could see in the literature review, high presence of incivilities (upkeep being one amongst them) is not appreciated by the users of public spaces, what leads to this kind of fluctuation in the values obtained.

When it comes to the analysis focusing on case by case, the results can be summarized as we can see in the table below:

Case	Boundary	Upkeep	Pleasantness
1	Privacy wall	Good	7.35
4	Active ground	Good	7.34
11	Security wall	Good	6.34
7	Symbolic wall	Good	5.05
2	Active ground	Bad	4.74
10	Privacy wall	Bad	4.62
3	No wall	Good	4.28
6	Fortress wall	Good	3.84
12	Security wall	Bad	3.74
9	Symbolic wall	Bad	3.54
8	Fortress wall	Bad	2.64
5	No wall	Bad	2.57

Table 1: Cases ranked by pleasantness

One interesting point that stands out in this table is the fact that two cases with bad upkeep (2 and 10) managed to outscore two cases with good upkeep (3 and 6). The outscored cases being those with boundaries classified as “No wall” and “Fortress wall”, which also clinched the two lowest overall scores for pleasantness.

From the Post hoc Tukey B analysis we can see that the respondents classified rather differently each of the cases, which gives the dataset enough heterogeneity, allowing us to observe that the various

typologies of transition between the spaces can have different levels of pleasantness associated to them. This heterogeneity can be seen in the table below:

Pleasantness

Tukey B: Harmonic Mean Sample Size = 428.000.

		Subset for alpha = 0.05						
Case	N	1	2	3	4	5	6	7
5	428	2,572						
8	428	2,638						
9	428		3,542					
12	428		3,738					
6	428		3,843					
3	428			4,283				
10	428				4,617			
2	428				4,738			
7	428					5,054		
11	428						6,336	
4	428							7,339
1	428							7,348

Table 2: Post hoc Tukey B analysis. Small subsets and none of the cases appearing two times shows a significant difference between them.

4.2 INTENSITY

In the cases 3 (good upkeep) and 5 (bad upkeep), when there are no walls, the average scores of intensity were 4.97 and 5.47 respectively, in a scale from 1 to 9 (T-test 2-tailed significance = 0.000). The frequency of the replies can be seen in the figure below:

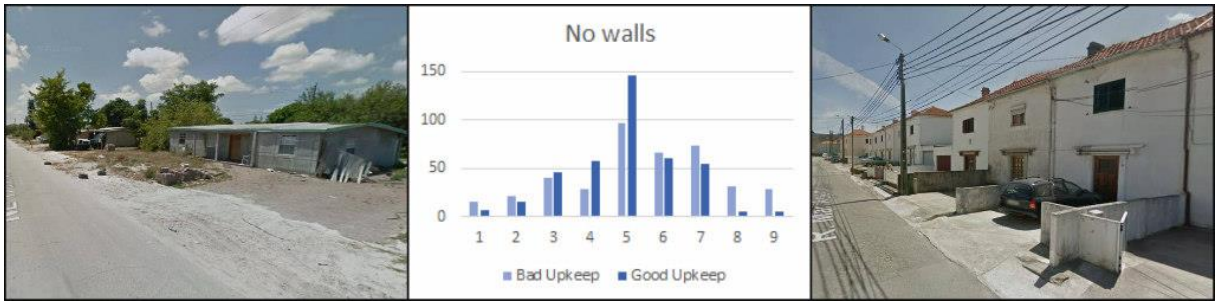

Fig. 25: Frequency of replies for intensity in the cases with no walls. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right

In the cases 7 (good upkeep) and 9 (bad upkeep), when there are symbolic walls, the average scores of intensity were 4.94 and 4.90 respectively, in a scale from 1 to 9 (T-test 2-tailed significance = 0.691). The frequency of the replies can be seen in the figure below:

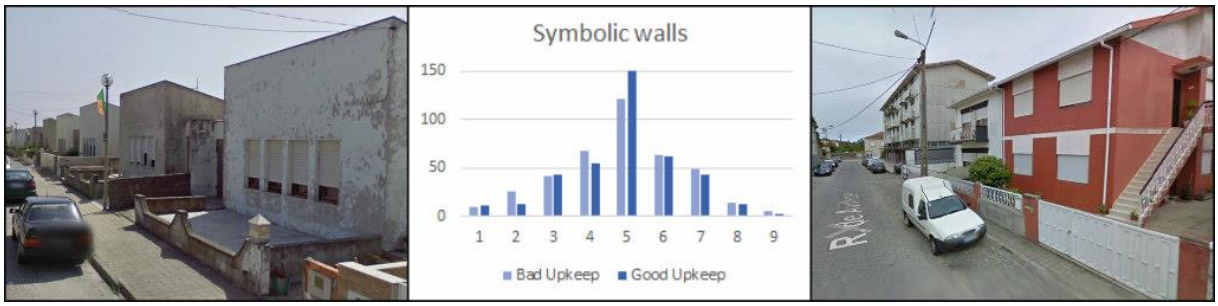

Fig. 26: Frequency of replies for intensity in the cases with symbolic walls. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right

In the cases 11 (good upkeep) and 12 (bad upkeep), when there are security walls, the average scores of intensity were 5.37 and 5.19 respectively, in a scale from 1 to 9 (T-test 2-tailed significance = 0.133). The frequency of the replies can be seen in the figure below:

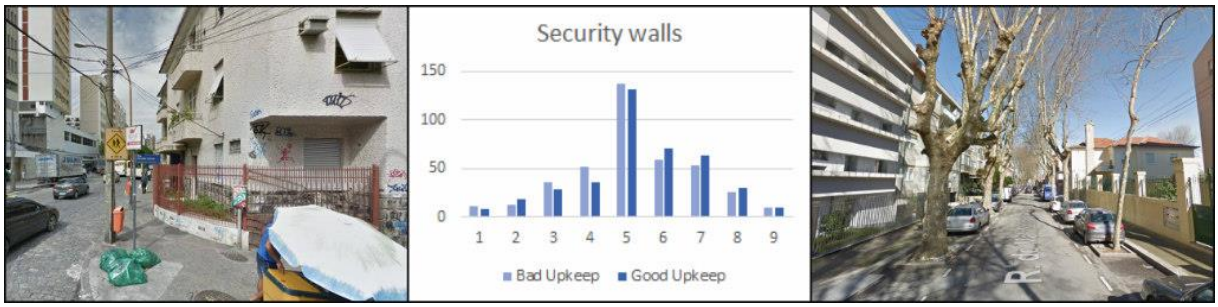

Fig. 27: Frequency of replies for intensity in the cases with security walls. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right.

In the cases 1 (good upkeep) and 10 (bad upkeep), when there are privacy walls, the average scores of intensity were 5.65 and 5.08 respectively, in a scale from 1 to 9 (T-test 2-tailed significance = 0.000). The frequency of the replies can be seen in the figure below:

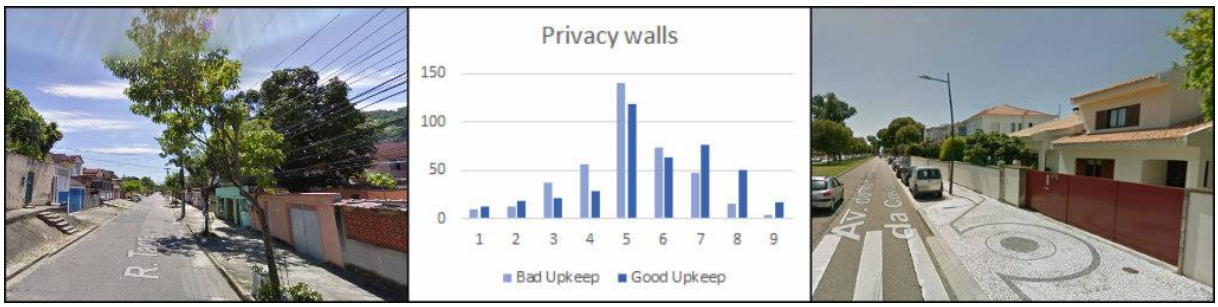

Fig. 28: Frequency of replies for intensity in the cases with privacy walls. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right.

In the cases 6 (good upkeep) and 8 (bad upkeep), when there are fortress walls, the average scores of intensity were 4.88 and 5.26 respectively, in a scale from 1 to 9 (T-test 2-tailed significance = 0.004). The frequency of the replies can be seen in the figure below:

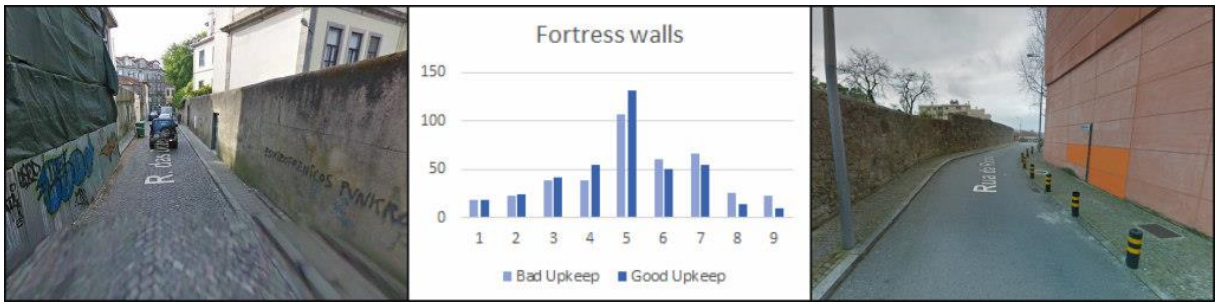

Fig. 29: Frequency of replies for intensity in the cases with fortress walls. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right.

In the cases 4 (good upkeep) and 2 (bad upkeep), when there is active ground level, the average scores of intensity were 6.12 and 5.73 respectively, in a scale from 1 to 9 (T-test 2-tailed significance = 0.001). The frequency of the replies can be seen in the figure below:

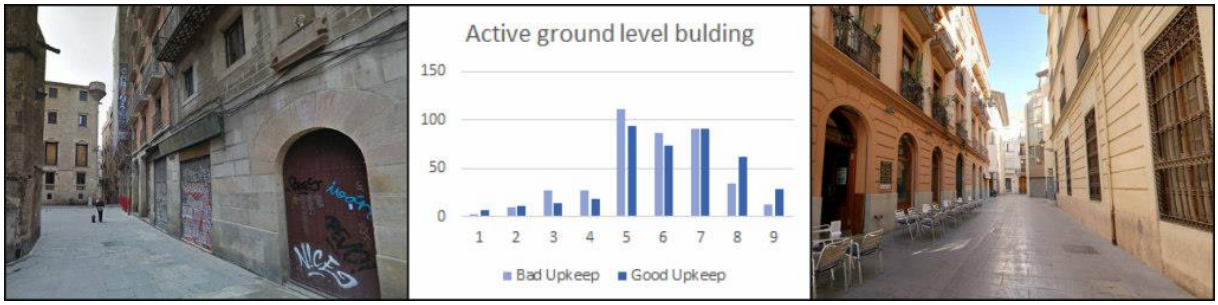

Fig. 30: Frequency of replies for intensity in the cases with active ground level buildings. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right.

When it comes to the results regarding intensity, the values obtained are not conclusive. First, due to the fact that many respondents declared lack of comprehension of this question, stating that it was not clear what was required from it, nor what intensity per se would mean in this context. Therefore, we assume that the high frequency of replies around the score of 5 (see table 3) represents a neutrality and/or indifference from the respondents towards this question. Second, during the Post hoc Tukey B analysis we can observe that the cases are rather clustered together, meaning that the respondents could not observe a significant difference between the images in terms of intensity. with a small detachment from the clusters in the case 4, as we can see in the table 4 below:

Case	Boundary	Upkeep	Intensity
4	Active ground	Good	6.12
2	Active ground	Bad	5.73
1	Privacy wall	Good	5.65
5	No wall	Bad	5.47
11	Security wall	Good	5.37
8	Fortress wall	Bad	5.26
12	Security wall	Bad	5.19
10	Privacy wall	Bad	5.08
3	No wall	Good	4.97
7	Symbolic wall	Good	4.94
9	Symbolic wall	Bad	4.90
6	Fortress wall	Good	4.88

Table 3: Cases ranked by intensity. The small value of 0,38 for the standard deviation points out the lack dispersion of the values

Intensity

Tukey B: Harmonic Mean Sample Size = 399.150.

		Subset for alpha = 0.05						
Case	N	1	2	3	4	5	6	7
6	399	4,877						
9	398	4,899	4,899					
7	396	4,944	4,944					
3	400	4,973	4,973					
10	397	5,076	5,076	5,076				
12	396	5,189	5,189	5,189	5,189			
8	400		5,263	5,263	5,263			
11	397			5,370	5,370	5,370		
5	402				5,465	5,465	5,465	
1	404					5,646	5,646	
2	403						5,734	
4	398							6,121

Table 4: Post hoc Tukey B analysis. Case 4 is the only one ungrouped, and several cases are presented in various subsets, showing lack of differentiation between the cases in the matters of intensity.

4.3 PERCEIVED SAFETY

In the cases 3 (good upkeep) and 5 (bad upkeep), when there are no walls, the average scores of perceived safety were 2.89 and 2.00 respectively, in a scale from 1 to 5 (T-test 2-tailed significance = 0.000). The frequency of the replies can be seen in the figure below:

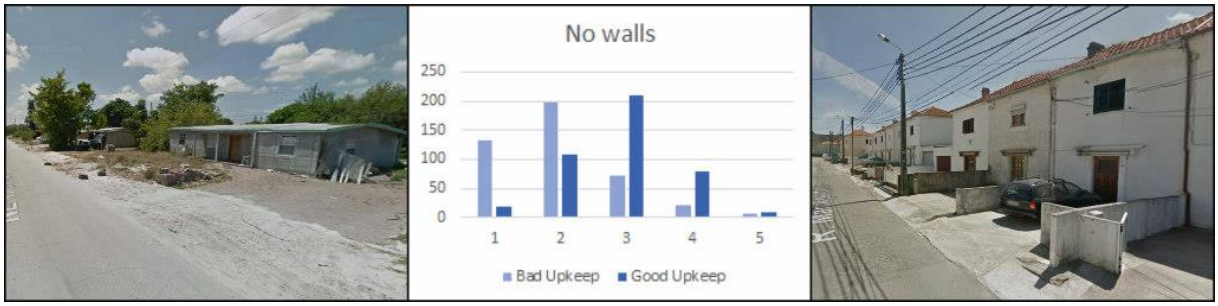

Fig. 31: Frequency of replies for perceived safety in the cases with no walls. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right

In the cases 7 (good upkeep) and 9 (bad upkeep), when there are symbolic walls, the average scores of perceived safety were 3.36 and 2.73 respectively, in a scale from 1 to 5 (T-test 2-tailed significance = 0.000). The frequency of the replies can be seen in the figure below:

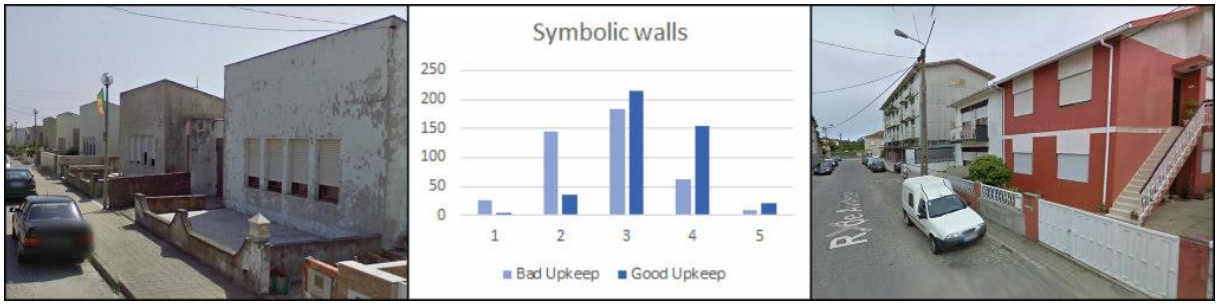

Fig. 32: Frequency of replies for perceived safety in the cases with symbolic walls. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right

In the cases 11 (good upkeep) and 12 (bad upkeep), when there are security walls, the average scores of perceived safety were 3.73 and 2.88 respectively, in a scale from 1 to 5 (T-test 2-tailed significance = 0.000). The frequency of the replies can be seen in the figure below:

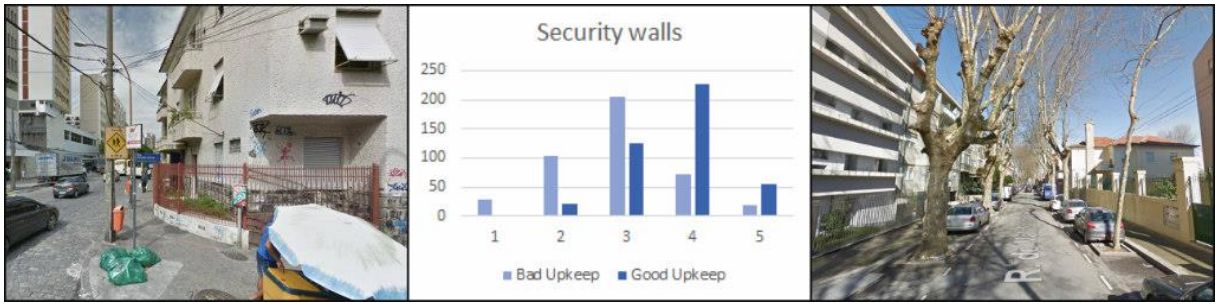

Fig. 33: Frequency of replies for perceived safety in the cases with security walls. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right.

In the cases 1 (good upkeep) and 10 (bad upkeep), when there are privacy walls, the average scores of perceived safety were 3.87 and 2.94 respectively, in a scale from 1 to 5 (T-test 2-tailed significance = 0.000). The frequency of the replies can be seen in the figure below:

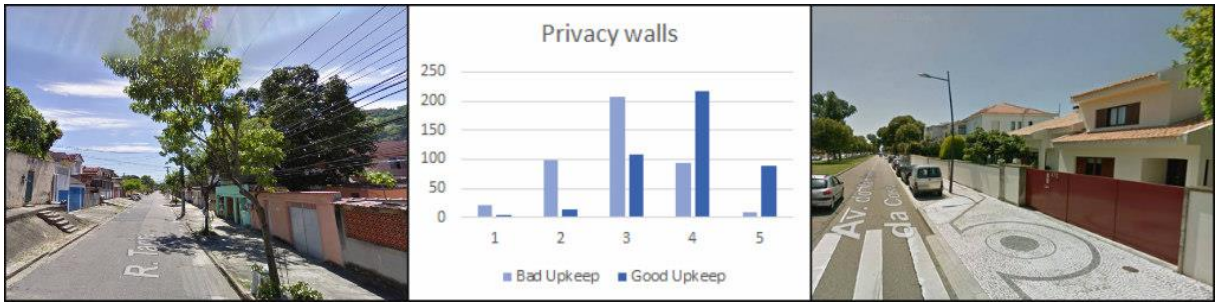

Fig. 34: Frequency of replies for perceived safety in the cases with privacy walls. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right.

In the cases 6 (good upkeep) and 8 (bad upkeep), when there are fortress walls, the average scores of perceived safety were 2.45 and 2.08 in a scale from 1 to 5 (T-test 2-tailed significance = 0.000). The frequency of the replies can be seen in the figure below:

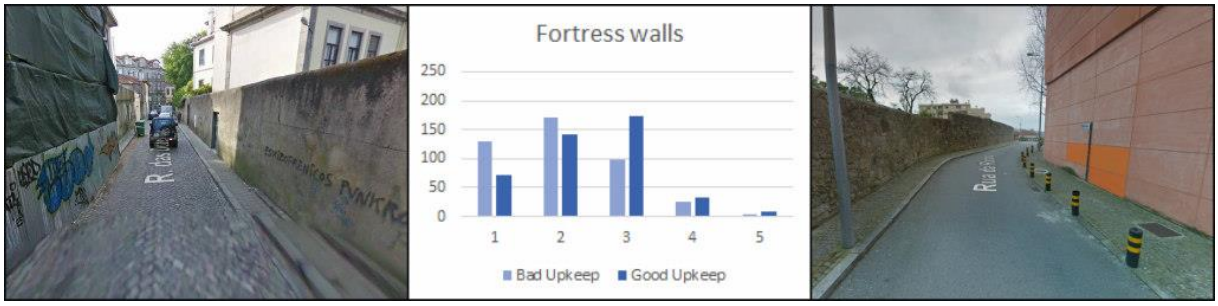

Fig. 35: Frequency of replies for perceived safety in the cases with fortress walls. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right.

In the cases 4 (good upkeep) and 2 (bad upkeep), when there is active ground level, the average scores of perceived safety were 3.90 and 2.70 in a scale from 1 to 5 (T-test 2-tailed significance = 0.000). The frequency of the replies can be seen in the figure below:

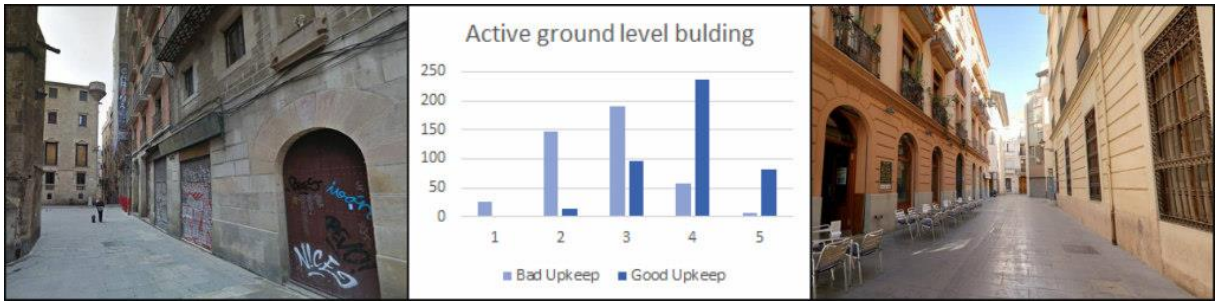

Fig. 36: Frequency of replies for perceived safety in the cases with active ground level buildings. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right.

The pattern observed in the replies for pleasantness repeats itself here on the replies for perceived safety. We can observe that regardless the type of transition, a worse upkeep leads to a lower feeling of security, as it is visible as the bars shift to the right as upkeep improves. The similar behaviour is not a coincidence, since the Pearson correlation between these two aspects was considerably high, r=0.701, with significance p=0.000 (Correlations are significant when 2-tailed significance $p<0.01$).

Again, such behaviour was expected, since on the literature we could observe that a bad upkeep is a form of incivility, which leads to a strong decrease in the perceived safety of the users of public spaces.

Taking a more detailed look to the data and comparing the results according to each case presented in the questionnaire, we can see how they are ranked corresponding to the perceived safety of the respondents in the table below:

Case	Boundary	Upkeep	Perceived Safety
4	Active ground	Good	3.90
1	Privacy wall	Good	3.87
11	Security wall	Good	3.73
7	Symbolic wall	Good	3.36
10	Privacy wall	Bad	2.94
3	No wall	Good	2.89
12	Security wall	Bad	2.88
9	Symbolic wall	Bad	2.73
2	Active ground	Bad	2.70
6	Fortress wall	Good	2.45
8	Fortress wall	Bad	2.08
5	No wall	Bad	2.00

Table 5: Cases ranked by the scores for perceived safety.

Once more we can see cases in which the typology of the boundary overcomes the influence of the bad upkeep. Spaces with good upkeep clinched the best scores, except in the case with the fortress wall, likewise what happened with pleasantness. Not only case 8 (fortress wall with bad upkeep) was ranked amongst the less safe options with a low score, case 6 (fortress wall with good upkeep) was also ranked poorly, with rather low perceived safety in comparison with the other cases with good upkeep. We can see the start of some evidence being spotted here, where fortress walls have a significant negative impact on how the users perceive the space around them. Furthermore, the logic goes the other way around for the images with active ground level buildings, since in both pleasantness and perceived safety they rank among the first positions. The actual significance of these apparent influences will be explored further in this chapter.

From the Post hoc Tukey B analysis we can also observe that the cases were considered different between them by the respondents, following what happened with pleasantness as well. However, the division in 7 subsets can be seen as more detailed than the previous ones, since the range of evaluation was solely between 1 and 5, while for pleasantness and intensity it was between 1 and 9. This means that the respondents perceived more uniqueness in the cases when analysing their feeling of safety in the space, which can, therefore, be a sign that even though people interpret pleasantness and safety in a

similar way, they can be more rigorous when evaluating their safety. The results for the Post hoc Tukey B analysis are shown in the table below:

Perceived Safety

Tukey B[a] Harmonic Mean Sample Size = 428.000.

Case	N	Subset for alpha = 0.05						
		1	2	3	4	5	6	7
5	428	2,002						
8	428	2,079						
6	428		2,451					
2	428			2,696				
9	428			2,731				
12	428				2,883			
3	428				2,895			
10	428				2,937			
7	428					3,364		
11	428						3,729	
1	428						3,867	3,867
4	428							3,897

Table 6: Post hoc Tukey B analysis. A few cases clustered, but no case is seen in more than one subset, what shows a clear differentiation of evaluation by the respondents.

4.4 FEAR OF CRIME

In the cases 3 (good upkeep) and 5 (bad upkeep), when there are no walls, the average scores of fear of crime were 3.06 and 3.70 respectively, in a scale from 1 to 5 (T-test 2-tailed significance = 0.000). The frequency of the replies can be seen in the figure below:

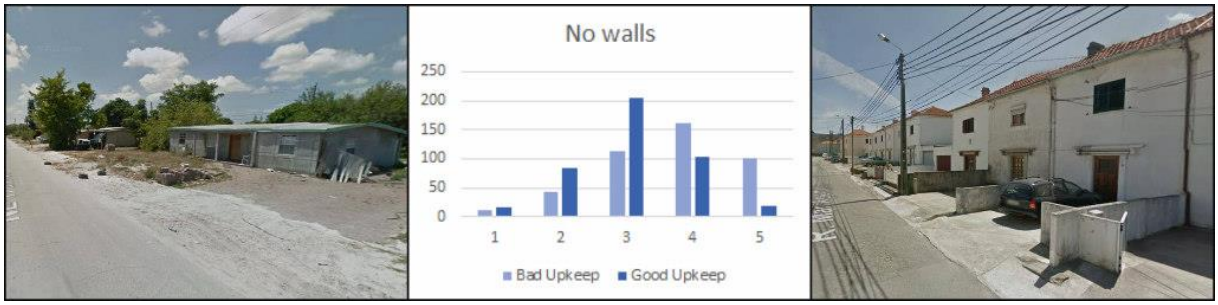

Fig. 37: Frequency of replies for fear of crime in the cases with no walls. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right

In the cases 7 (good upkeep) and 9 (bad upkeep), when there are symbolic walls, the average scores of fear of crime were 2.65 and 3.11 respectively, in a scale from 1 to 5 (T-test 2-tailed significance = 0.000). The frequency of the replies can be seen in the figure below:

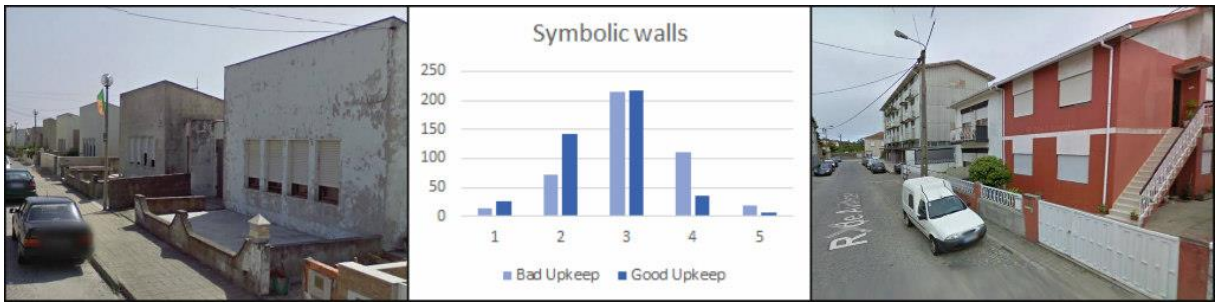

Fig. 38: Frequency of replies for fear of crime in the cases with symbolic walls. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right

In the cases 11 (good upkeep) and 12 (bad upkeep), when there are security walls, the average scores of fear of crime were 2.42 and 3.07 respectively, in a scale from 1 to 5 (T-test 2-tailed significance = 0.000). The frequency of the replies can be seen in the figure below:

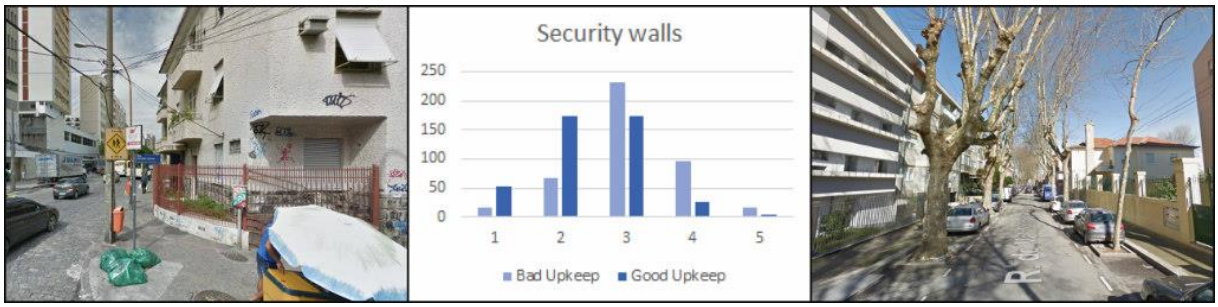

Fig. 39: Frequency of replies for fear of crime in the cases with security walls. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right.

In the cases 1 (good upkeep) and 10 (bad upkeep), when there are privacy walls, the average scores of fear of crime were 2.47 and 3.05 respectively, in a scale from 1 to 5 (T-test 2-tailed significance = 0.000). The frequency of the replies can be seen in the figure below:

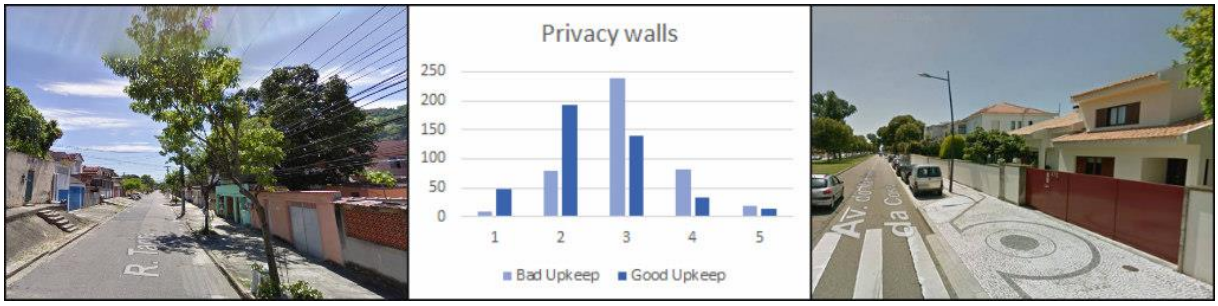

Fig. 40: Frequency of replies for fear of crime in the cases with privacy walls. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right.

In the cases 6 (good upkeep) and 8 (bad upkeep), when there are fortress walls, the average scores of fear of crime were 3.38 and 3.78 in a scale from 1 to 5 (T-test 2-tailed significance = 0.000). The frequency of the replies can be seen in the figure below:

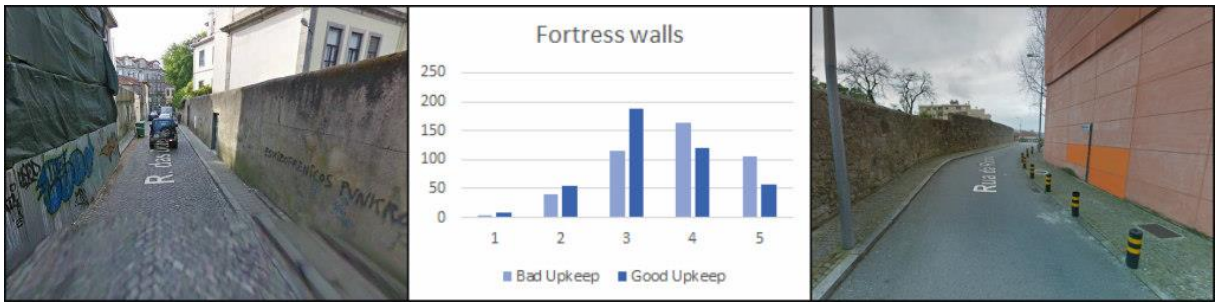

Fig. 41: Frequency of replies for fear of crime in the cases with fortress walls. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right.

In the cases 4 (good upkeep) and 2 (bad upkeep), when there is active ground level, the average scores of fear of crime were 2.38 and 3.31 in a scale from 1 to 5 (T-test 2-tailed significance = 0.000). The frequency of the replies can be seen in the figure below:

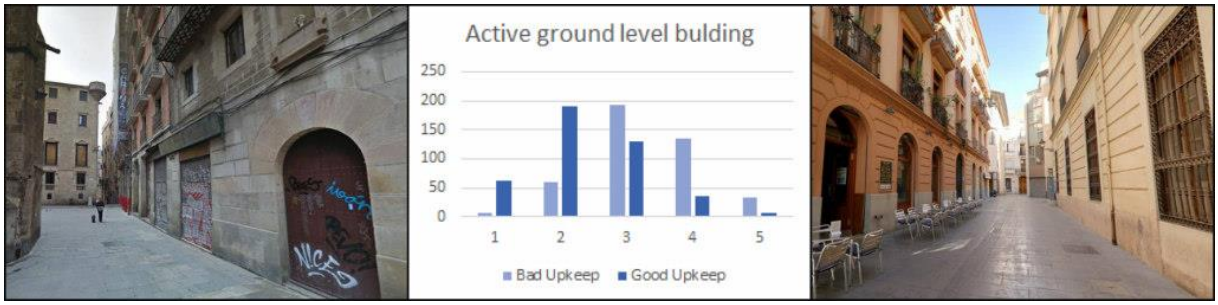

Fig. 42: Frequency of replies for fear of crime in the cases with active ground level buildings. Images used for the questionnaire are presented as bad upkeep on the left and good upkeep on the right.

It is possible to notice now that bad upkeep has the opposite influence on the charts. The bars shift to the left when respondents see themselves in situations of good upkeep, which tells us that spaces with bad upkeep tend to cause a bigger fear of crime. Once over, the presence of incivilities plays a negative role on the overall perception of the space, and how one would fell there.

As one intuitively would assume and it can be observed in the dataset, fear of crime has an inversely proportional behaviour from the one of perceived safety: the safer the space is considered, smaller fear of crime will be.

Overviewing this aspect case by case we are presented with the scenario visible on the table below:

Case	Boundary	Upkeep	Fear of Crime
8	Fortress wall	Bad	3.78
5	No wall	Bad	3.70
6	Fortress wall	Good	3.38
2	Active ground	Bad	3.31
9	Symbolic wall	Bad	3.11
12	Security wall	Bad	3.07
3	No wall	Good	3.06
10	Privacy wall	Bad	3.05
7	Symbolic wall	Good	2.65
1	Privacy wall	Good	2.47
11	Security wall	Good	2.42
4	Active ground	Good	2.38

Table 7: Ranked scores for fear of crime. Colour scale inverted, so red values represent worse conditions

As mentioned above, we can observe that this table looks like the one from perceived safety, but flipped upside down. Now we can see that cases with bad upkeep populate the top part of the table, while the ones with good upkeep are ranked at the bottom. Once more, the exception that catches the eye is the case 6 (fortress wall with good upkeep), when a high level of upkeep, which was supposed to play in favour of a low fear of crime, is overcome by the type of boundary. Such ranking follows the logic we have seen in the previous analysis, accusing the fortress wall of being a possible relevant aspect that leads to negative perceptions of the space.

Moreover, it is interesting that within the dataset we could observe a Pearson correlation between perceived safety and fear of crime with a value of r= -0.699, and between fear of crime and pleasantness with a value of r= -0.523, both with significance p=0.000 (Correlations are significant when $p<0.01$). This states that the two variables are indeed correlated, but inversely proportional, in accordance with what we could observe in the charts and in the table 7.

When it comes to the Post hoc Tukey B analysis, we can see one more time that the respondents were able to identify clear differences between the cases presented, and even though the final number of subsets was smaller than the one related to perceived safety (5, instead of 7), none of the cases appeared in more than one cluster or subset. The results can be seen in the table 8 below:

Fear of Crime

Tukey B: Harmonic Mean Sample Size = 428.000.

Case	N	Subset for alpha = 0.05				
		1	2	3	4	5
4	428	2,376				
11	428	2.423				
1	428	2.472				
7	428		2.654			
10	428			3.051		
3	428			3.063		
12	428			3.068		
9	428			3.107		
2	428				3.308	
6	428				3.383	
5	428					3.699
8	428					3.776

Table 8: Post hoc Tukey B analysis. A few cases clustered, but no case is seen in more than one subset, what shows a clear differentiation of evaluation by the respondents.

4.5 IMPORTANCE EVALUATION

In order to analyse how relevant each of the factor listed for them on the last question of the questionnaire, it is necessary to understand some aspects associated to that specific question.

When we asked "how relevant" each factor was for rating the safety of the space, we miss the information about whether that factor had a positive or a negative influence on the respondent's reply. Therefore, what we can read from this information is how much one specific factor stands out to the eyes of the people who contributed to the survey, in comparison with the other factors. We can see this contrast on the table 9 below:

Factor	Relevance
Sidewalk Width	3.18
Building Ukpeek	3.80
Public Space Upkeep	3.87
Building Height	2.92
Vegetation Type	2.60
Type of Boundary	3.27
Graffiti	2.63
Lack of People	3.66

Table 9: Average score for each factor's relevance on the analysis of safety according to the respondents. Scale from "Not important at all" to "Very Important" translated into 1 to 5

From this table, we can see that the respondents did not consciously give much importance to the type of boundary when rating the safety perceived in each image. Actually, this value of 3.27 is rather close from the overall average score of the factors, which is 3.24. This could mean that, in general, people do not consider the transition between the public and the private space as a crucial trait that could affect their safety on the streets, or at least not more relevant than other well-known impacting aspects such as the upkeep or the presence of people. However, investigating this data a bit deeper we can analyse the average score for these factors splitting them case by case, ranking the values according to the scores for "Type of Boundary" like we can observe the following table 10:

Case	Boundary	Upkeep	Type of Boudary	Sidewalk Width	Building Ukpeek	Public Space Upkeep	Building Height	Vegetation Type	Graffiti	Lack of People
8	Fortress wall	Bad	3.69	3.70	4.01	4.04	3.19	2.31	3.23	4.01
6	Fortress wall	Good	3.48	3.28	3.21	3.33	3.34	2.44	2.29	4.06
1	Privacy wall	Good	3.44	3.26	3.87	4.05	2.74	3.18	2.90	3.59
10	Privacy wall	Bad	3.37	3.22	3.75	3.85	2.89	2.93	2.48	3.60
7	Symbolic wall	Good	3.33	3.14	3.57	3.68	2.84	2.44	2.31	3.43
11	Security wall	Good	3.32	3.27	3.92	3.91	3.18	2.95	2.43	3.34
3	No wall	Good	3.31	3.10	3.63	3.75	2.74	2.53	2.48	3.63
9	Symbolic wall	Bad	3.26	3.03	3.90	3.86	2.82	2.38	2.43	3.65
12	Security wall	Bad	3.19	3.21	3.77	3.90	2.94	2.44	3.00	3.53
5	No wall	Bad	3.18	2.97	4.19	4.15	2.50	3.15	2.30	3.96
2	Active ground	Bad	2.96	2.84	3.78	3.87	3.04	2.32	3.25	3.87
4	Active ground	Good	2.75	3.16	3.94	4.02	2.81	2.17	2.52	3.22

Table 10: Average relevance score for each factor inquired, case by case. Cases are ranked by the values associated to the type of boundary

Looking at this table we can notice that the respondents considered the type of boundary or transition between the public and the privates more important on the cases with fortress walls. Taking into account that those cases were always ranked amongst the least safe, least pleasant or riskier of hosting criminal activities, we can say that this type of boundary plays a role on bringing up some of these undesired situations. It also stands out on the table the fact that the lack of people is more relevant when there are fortress wall and, therefore, no eyes on the streets. On the other side, where the lack of people has the lowest impact on safety was when there were active ground level buildings with good upkeep.

Looking at the post hoc Tukey B analysis for the factor "type of boundary" (table 11), we can confirm the fact that the respondents perceived the two cases with fortress wall (8 and 6) to be distinct from the others, as we can see them clustered in one subset. The fact that case 6 is also clustered with other cases can be seen as the impact of the sidewalk width (which is very much associated with the transition itself) in the respondent's analysis, since the same pattern is seen on this factor's post hoc Tukey B table.

Type of Boundary

Tukey B: Harmonic Mean Sample Size = 428.000.

Case	N	Subset for alpha = 0.05				
		1	2	3	4	5
4	428	2,752				
2	428	2,958				
5	428		3,185			
12	428		3,194	3,194		
9	428		3,264	3,264	3,264	
3	428		3,313	3,313	3,313	
11	428		3,322	3,322	3,322	
7	428		3,334	3,334	3,334	
10	428		3,367	3,367	3,367	
1	428			3,442	3,442	
6	428				3,479	3,479
8	428					3,687

Table 11: Post hoc Tukey B analysis. Cases 8 and 6 are in the same homogeneous subset.

Once more, is relevant to state that due to the way this question was presented in the questionnaire, positive and negative influences could be balanced out in this result. The tendency is that, however, when grading their safety people will overvalue the importance on the cases when the factors give more negative influence than on those where it causes positive impact.

What can also be analysed from this part of the data set is if and how gender and nationality can influence on the importance given to each factor inquired. Performing a T-Test on the SPSS software allows us to observe that. Many of the factors were found to be under no statistical significant impact from gender and or nationality. Since investigating safety related to the type of transition is the focus of this thesis, here we can observe how just these two factors are influenced by nationality and gender:

	Perceived Safety	**Relevance of Type of Boundary**
Females	2.89	3.38
Males	3.04	3.16
Significance	*0.000*	*0.000*
Portuguese	2.98	3.25
Brazilian	2.92	3.30
Significance	*0.027*	*0.192*

Table 12: Average scores divided by gender and nationality

Considering that T-Tests recognize the specifications made (by gender or nationality, in this case) as statistical significant only if the value for 2-tailed significance $p < 0.01$, it is visible that even though there are different averages for both genders and nationalities, only those associated to gender are significant. That being said, we can observe that women feel, in general, less safe than men, which was, expected. What is also noticeable is that women also tend to give more importance to type of transition between public and private spaces than man do.

4.6 MULTI VARIABLE ANALYSIS

After observing the results associated to each question of the survey we were ready to move forward towards an analysis, developing the tests that allowed us to check if and how well we can explain the influence of the different types of transition between public and private spaces on the perceived safety of people.

In order to do that we decided to perform a Univariate Analysis of Variance on the SPSS software, that allows us to observe the correlation between different variables, and how the behaviour of one specific variable can be explained by a group of others in the same dataset.

Amongst the numerous possible combinations of explanatory variables that we could choose to describe perceived safety (the scope of this thesis), we decided to narrow down the options to those we wanted to focus our investigation on. Therefore, we built our Univariate Analysis of Variance looking for how perceived safety is described by the type of transition, upkeep level, gender and whether the respondent has been a victim of crime recently or not.

Upon using those variables, we could achieve some interesting results (table 13). It is possible to notice looking at the values of "Significance" and "F-test" that individually, "upkeep" (Sig = 0.000; F = 398.242), "type of transition" (Sig = 0.000; F = 160.099) and "victim of crime" (Sig = 0.010; F = 6.612) are statistically significant in the model. This means that those explanatory variables are important factors to be considered when describing the dependent variable "perceived safety". The model itself had a R squared value of 0.370 (0.364 adjusted). Surprisingly, the explanatory variable "gender" was not significant according to the model.

Tests of Between-Subjects Effects

Dependent Variable: Perceived Safety R Squared = .370 (Adjusted R Squared = .364)

Source	Type III Sum of Squares	df	Mean Square	F Test	Sig.
Corrected Model	1754,426	36	48,734	69,612	,000
Intercept	2191,736	1	2191,736	3130,666	,000
Age	6,106	1	6,106	8,721	,003
Type of Transition	560,416	5	112,083	160,099	,000
UpKeep	278,803	1	278,803	398,242	,000
Victim of crime	4,629	1	4,629	6,612	,010
Gender	2,169	1	2,169	3,098	,078
Transition * UpKeep	66,141	4	16,535	23,619	,000
Transition * Victim of crime	1,996	5	,399	,570	,723
Transition * Gender	4,570	5	,914	1,306	,258
UpKeep * Victim of crime	,687	1	,687	,982	,322
UpKeep * Gender	,307	1	,307	,439	,508
Victim of crime * Gender	,088	1	,088	,125	,723
Transition * UpKeep * Victim of crime	,000	0	.	.	.
Transition * UpKeep * Gender	6,541	4	1,635	2,336	,053
Transition * Victim of crime * Gender	3,326	5	,665	,950	,447
UpKeep * Victim of crime * Gender	,480	1	,480	,685	,408
Transition * UpKeep * Victim of crime * Gender	,000	0	.	.	.
Error	2991,468	4273	,700		
Total	40964,000	4310			
Corrected Total	4745,894	4309			

Table 13: Univariate Analysis of Variance

We can also observe in the table that “type of transition” and “upkeep” have together a considerable significance on the model, unlike any other combinations of the explanatory variables.

5

CONCLUSION

5.1 DISCUSSION

From all the results obtained from the data there are a few points that are worth discussing. The first and most expected one is the impact that upkeep causes in the perceived safety of the space. This aspect was covered in the literature review, and this result backs up the theory that incivilities are indeed a factor that reduces the overall quality of the space, not only in terms of pleasantness, but also when it comes to how safe one might feel on that said space. In our Univariate Analysis of Variance, we could observe that upkeep was the explanatory variable with the biggest influence on the perceived safety, and we can see this as a reassurance for our survey's consistency and data collection.

Another point to be presented is the fact that nationality or age did not have a significant impact on the results. We could have expected that given different backgrounds and contact with different levels of crime could lead to relevant variations in one's the perceived safety, but this was not shown by our data. One more curious aspect of our results is that being a victim of crime or not had just a minor weight on ones perceived safety, if compared with the relevance of upkeep level or the typology of the boundaries. The fact that recent exposure to crime has an impact on the result is, however, expected and backed up by the literature, once more giving consistency to our results.

When it comes to the type of transition between the public and the private space – the focus of this thesis-, the most relevant aspect to be discussed is the specific case of the Fortress Wall. We could observe that in every analysis this type of transition stood out as either the worst or the second worst case, considering pleasantness, safety or fear of crime. Even in conditions of good upkeep, having a boundary described as fortress wall was a trait that made that space underperform in our survey in comparison with the other types of transition. In addition to that, respondents consider the typology of the boundary as a more relevant aspect to their safety exactly on the cases in which a fortress wall was

present. That is a pattern that cannot be overlooked. From our research, we could not rank the different transitions from safest to most unsafe, but we could clearly notice that Fortress Walls affect negatively one's perceived safety in the public space.

On the other hand, we were not able to make an explicit conclusion about which type of boundary promotes the highest level of perceived safety to the users of the space, but we could observe that cases in which we have buildings with active ground level always appeared amongst the best ranked cases in our analysis.

This scenario allows us to make a link with what was exposed in the literature review, more specifically to the concept of "eyes in the street". The possibility of involuntary surveillance is a major difference between the two types of boundary mentioned above, especially under circumstances in which there is nobody on the streets. When somebody finds him or herself in an empty street surrounded by fortress or blind walls, they will be closed by boundaries that allow no human interference in case of an unwanted encounter takes place. In the opposite scenario, however, this is not true. Doors and windows at the street level give the idea that people are or might be there, especially if something bad occurs. The user of the space presumes that activities are happening and that people are possibly around (as we can see on the results, where "Lack of people on the streets" was considered less relevant exactly on the cases with active ground floor buildings).

This might be the biggest contribution of this study. Even though there is not such a big difference on how safe people feel by different types of transitions between public and private spaces, when they are around fortress wall their perceived safety falls drastically. However, such affirmation can only be made considering the limitations of this study

5.2 LIMITATIONS & RECOMMENDATIONS

Even though the study lead to a few solid conclusions, there were limitations to its reach and capacity of analysis of the problem we inquired.

The first limitation of this thesis is related to the amount of control variables used in the sorting of the images presented in the questionnaire. As it was mentioned on the literature review and on the methodology section, there are many more factors that have influence over our perceived safety, and covering all of them and all the possible combinations between them would lead to rather extensive questionnaire, with too many cases to be analysed by the respondents. A recommendation towards this issue lies on a possibility that would present different images from a database to different respondents,

but that would require a larger number of replies, or the statistical significance of the data would be harshly reduced.

Still on the matter of the images presented, another limitation of the study lies on the fact that real imagery was used on the questionnaire. Even though presenting real scenarios helps the respondents to put themselves in that situation, we allow too many potential distractions to intervene in their analysis of the space. Factors that were not under the scope of the study might have an influence that is not measured and possibly not even considered. Nasar (2001) backs up this issue, and a possible way to deal with this concern in future studies is to have manipulated images instead, where a standardized space is chosen, and the control variables are adapted according to the scenario desired. This solution requires a more detailed pre-treatment of the imagery, but it can lead to more conclusive results.

When it comes to the questions asked in the questionnaire, during the data treatment was possible to observe that better choices could have been made. For instance, when the respondents were asked how important to their analysis was each factor presented in a list, we lost the capacity to fully obtain the information about the impact of each factor. Merely asking how relevant a given factor is to the analysis does not tell us whether that factor had a negative or a positive impact on the judgment. Future studies using the same or similar methodology might approach the respondents in a way that this input is captured, which would allow more concrete conclusions about the relevance of each of the listed factors.

In addition to that, another major limitation of this thesis relates to the focus group used to collect the data. As defined by Henrich *et al.* (2010), our focus group falls under the W.E.I.R.D. category: Western, Educated, Industrialized, Rich, and Democratic. Therefore, despite our results presented significant outcomes, it is important to have in mind that who we inquired belongs to a narrow sample of what we can call “human variation”, so their inputs for our research is not necessarily true to every culture around the planet. Trying to collect data from more diverse groups of people, even reach the point of define a sampling strategy that covers more diversity than what falls under the W.E.I.R.D. group, can be a way of presenting less biased results in future researches.

6

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ANNEXES

ANNEX I

Image for questionnaire's case 2: Building working as the boundary and low upkeep level

A. 1 (source: Google Street View, 2017)

Image for questionnaire's case 3: No walls and high upkeep level

A. 2 (source: Google Street View, 2017)

Image for questionnaire's case 4: Building working as the boundary and high upkeep level

A. 3 (source: Google Street View, 2017)

Image for questionnaire's case 5: No walls and low upkeep level

A. 4 (source: Google Street View, 2017)

Image for questionnaire's case 6: Fortress/blind walls and high upkeep level

A. 5 (source: Google Street View, 2017)

Image for questionnaire's case 7: Symbolic walls and high upkeep level

A. 6 (source: Google Street View, 2017)

Image for questionnaire's case 8: Fortress/blind wall and low upkeep level

A. 7 (source: Google Street View, 2017)

Image for questionnaire's case 9: Symbolic walls and low upkeep level

A. 8 (source: Google Street View, 2017)

Image for questionnaire's case 10: Privacy wall and low upkeep level

A. 9 (source: Google Street View, 2017)

Image for questionnaire's case 11: Security walls and high upkeep level

A. 10 (source: Google Street View, 2017)

Image for questionnaire's case 12: Security wall and low upkeep level

A. 11 (source: Google Street View, 2017)